Assessing Individual Knowledge in the Public Sector: A Case Study on The Public Relations Department in Saudi Aramco

By

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ABSTRACT

The study began with the understanding that knowledge management is critical but presents a challenge to accurately measure the outcome of individual knowledge management and at the same time distinguishes the various activities that attribute to knowledge management. The research is intended by an insider-researcher to answer the following question: How can individual knowledge be assessed and pinpointed in the Public Relations Department in Saudi Aramco?

Although, objectives have been developed in consideration of the research question, following which the study is conducted. The objectives are: To assess and pinpoint individual knowledge in Public Relations Department within Saudi Aramco as a public-sector organisation and to introduce a framework for the implementation of established knowledge assessment and identification of a knowledge holder in the organisation. Therefore, the purpose of this study is to empirically determine/introduce a framework to accommodate the objectives mentioned above. Although the research is conducted on a sample of one department, it would act as a prototype for an organisation wide implementation. Furthermore, it would create an actionable knowledge generated to implement on the whole departments in Saudi Aramco.

Thus, the study is conducted using Action Research methodology. The action research was carried out in two cycles (Mapping the Terrain and Testing the Plausibility) with the first cycle being divided into two phases. Phase one of Mapping the Terrain consisted of conducting 26 qualitative interviews within the department to identify the organisational culture with regards to knowledge management in the organisation. Phase two of Mapping the Terrain was carried out by operationalising the MinK Framework with the same 26 participants. The second action research cycle comprised of conducting a focus group interview with 8 members of the executive management team. They were first showed the results of the MinK framework and then asked to provide their opinion on how MinK can be applied to the organisation.

The study has verified the existence of the workplace-based problem that there is no mechanism to measure individual knowledge in Public Relations Department or even in Saudi Aramco as a whole. However, it was noted that the organisation has made several attempts to establish a framework for effective knowledge management and pinpointing. The results of the focus group indicate that application of MinK framework will not only be beneficial to the organisation but also allow the organisation to increase its efficiency both in terms of its internal staff and potential, new recruits. Therefore, the MinK Framework would be an appropriate tool for Saudi Aramco, as a public sector organisation.

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DECLARATION

I, Saad Alaboub hereby declare that the contents included in this Doctor of Business Administration (DBA) thesis are entirely my own work, have been developed specifically for the research, and have not been previously submitted for any other qualification.

ABBREVIATION LIST

AHP	Analytic Hierarchy Process
ARAMCO	Saudi Arabian Oil Company
BSc	Balanced Scorecard
HCI	Human Capital Index
HSE	Health Safety and Environment
IC	Intellectual Capital
ICT	Information and Computer Technology
IK	Individual knowledge
IKI	Individual knowledge indicators
IT	Information Technology
KAI	Knowledge Application Indicators
KFI	Knowledge Flow Indicators
KM	Knowledge Management
KMS	Knowledge Management System
KWPA	Knowledge Work Productivity Assessment
KMVI	Knowledge Market Value Indicators
KSI	Knowledge Stock Indicators
PR	Public Relations
PRD	Public Relations Department
MCDA	Multi-Criteria Decision Analysis
MinK	Measuring Individual Knowledge
WSM	Weight Sum Model

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1. Introduction

1.1. Background

The inspiration for this study developed while the researcher was working as a PR Director in Public Relations Department in Saudi Aramco—where Saudi Aramco is considered as a public sector organisation. The company is a global integrated company in both energy and chemicals, in addition to being a leader in exploration and production, refining and distribution, which made it the world's top exporter of crude oil and natural gas liquids. It manages the largest conventional crude oil reserves in the world. Dhahran, Saudi Arabia, is the headquarters of Saudi Aramco. The company's workforce is around 55,000 Saudis and 10,000 expatriates—totalling 65,000. In addition to its operation in the Kingdom of Saudi Arabia, it also operates through its joint ventures, affiliates and subsidiary offices in Japan, Egypt, China, India, the Netherlands, the Republic of Korea, Singapore, the United Arab Emirates, the United Kingdom and the United States.

1.1.1. Saudi Aramco's Objective and Overview on KM

Saudi Aramco is like any other company—its knowledge management trend is the attempt to make sure knowledge is retained and shared within the company. Thus, knowledge management in Saudi Aramco is done using a collaborative and integrated approach to the creation, capture, organisation, access to and use of an enterprise's intellectual assets to enhance organisational performance.

This strategic capability will grow and enable the corporate intellectual capital to drive Saudi Aramco's business outcomes, gain competitive advantage and develop a robust organisational learning process. Organisational learning can be defined as a process with which organisations seek out ways to manage their internal resources in the organisation (Argyris, 1994) and become proficient at knowledge management by the development, procurement, exchange, and modification of old routines to depict new knowledge (Huber, 1991). Identifying strategic and business-critical knowledge and embedding knowledge management practices into our core business processes are essential factors to increase productivity, optimise project and operating costs, and improve HSE (health, safety and environment). Saudi Aramco is committed to cultivating and improving its knowledge sharing culture, processes, technology and people collaboration. Overview summary:

- People-- Establish accountability through corporate KM board
- Processes-- Optimise processes through project knowledge management
- Content-- Standardising knowledge through knowledge mapping
- Technology-- Integrate systems through corporate technical alert

1.1.2. The Knowledge Economy

In every company, intangible resources, human capital may be the most vital and thoughtful for competitive advantage because it is very difficult to imitate (Joia, 2000). Although a given organisation may possess more or less of any particular resource, only those resources that are rare, valuable, and difficult to imitate, provide a sustainable competitive advantage (Amit & Schoemaker, 1993; Barney, 1991; Schoenecker & Cooper, 1998). Relatively recent research has indicated that human capital development practices have the potential to substantially contribute to competitive advantage by motivating employees, enabling them with higher capabilities, and outlining the supply-demand-side mobility (Delery and Roumpi, 2017). Furthering this idea, Campbell and Kryscynski (2019) have indicated that human capital itself is not a source of competitive advantage, but the underlying mechanisms that develop this human capital are.

Knowledge plays an important role in the economy. In the knowledge economy, governments are increasingly faced with international and national competition within policy implementation and the service delivery sector. Knowledge economy is defined as being an economy that is based on knowledge-intensive activities which drive its services and production and which contribute towards scientific and technological advances (Powell and Snellman, 2004). Internationally, governmental and non-governmental institutions are faced with competition from similar setups which supply similar services overseas (Marilena *et al.*, 2008). Nationally, the competition existing between public sector organisations is boosted by trends of increased decentralisation seen across the globe.

1.2. Motivations of the study

1.2.1. The Need for Knowledge Assessment for the Public Sector

The main aim of developing this study is to understand and assess individual knowledge in the Public Relations Department, Saudi Aramco. Individual knowledge is defined as being knowledge that is both tacit and explicit and which is often manifested as expertise or skill in individuals (De Long and Fahey, 2000). Besides discussing knowledge management and its importance in public sector organisations, the research in this thesis carries out a detailed assessment of the present KM practices in one particular department within Saudi Aramco. It is crucial to note that knowledge management systems have emerged only recently, and for Saudi Aramco to be fully updated in this respect and in relation to its own internal requirements, it is expected that a timeframe of 1-3 years will be required. This is an internal operational estimate provided by the management of the organisation which is being made evident to the researcher due to his insider role in the organisation.

The organisation is expected to be proactive in these efforts by providing training and arranging workshops, in addition to engaging staff in the pursuit of enhanced knowledge management. It will also require educating staff on the role it plays in the growth and sustainment of the organisation (Witherspoon *et al*., 2013). This is essential since knowledge management systems require employees to interact within business divisions, across business divisions and at various levels of hierarchy. This study investigates the role of knowledge management and its importance in sharing individual knowledge in an organisation. Knowledge management refers to the handling of corporate knowledge and intellectual resources that can enhance a variety of organisational performance attributes and augment worth by allowing an organisation to work in an intellectual manner (Gupta *et al.*, 2000).

However, while private sector organisations are highly incentivised by competition to implement such practices in order to survive in a competitive environment, there is typically a lag in the acceptance and implementation of such practices in public sector organisations as they are incentivised differently (where the private sector is driven by profit generation, the public sector is a service-based organisation and is not concerned with profit generation). Knowledge management helps organisations to recognise, choose, spread and transfer crucial information and skills that are an element of the institutional memory. Institutional memory can be defined as the collective history that employees hold as memory regarding the events or experiences that occur in the organisation (Sawy, Gomes, and Gonzalez, 1986). The authors also stated that preserving institutional memory is of crucial importance due to each individuals' recollection of the same event and experience being different from one another. This characteristically is found within an organisation in an unorganised way. The ordering and systemising of knowledge management allow for successful and efficient resolution of issues, dynamic learning, tactical planning and making of decisions. The emphasis of knowledge management is on recognising knowledge, explaining it such that it can be used collaboratively by all officially and hence can be reused effectively (Gupta et al., 2000). Besides that, knowledge management is acknowledged as a significant element in the business domain today. Therefore, the study provides evidence on the importance of knowledge management and its key aspects or goals that have been described in Chapter 2 (Literature Review) of the research.

The main reason for developing the study is to identify the importance and need for knowledge management in a public organisation—while researching PRD, Saudi Aramco in particular. It has focused on how knowledge management has helped in sharing knowledge through individuals in a public company such as Saudi Aramco. Knowledge

management has been able to change the model used in public sector organisations by turning the focus of the organisations to learning blocks, where the knowledge is invented, shared, captured or applied to meet the objectives of the organisation. It has been shown to increase the profit of a company (Zack et al., 2009). Moreover, the individuals also gather sufficient knowledge which helps them in enhancing individual and organisational productivity (Hislop, 2013). Knowledge management is also related to knowledge sharing which is a critical factor in an organisation's success (Intezari, Taskin, and Pauleen, 2017; Tan, 2016; Yasir and Majid, 2017). Successful knowledge management is not the only solution to an organisation's need for adaptation; it is, in fact, one of several elements of good management. Complete planning, shrewd marketing, quality goods and facilities, focus on the clients, a successful framework for the work and the considerate handling of the organisation's assets and other such elements are not independent of knowledge management (Makela et al., 2012).

Moreover, the matter of implementation of existing knowledge management practices is not a simple matter and requires substantial research as well evidenced as follows. For knowledge management to be successfully handled in organisations there needs to be additional focus on contextual aspects of the organisation including the strategy, culture and technology—especially when it comes to assessing individual knowledge in a public-sector company like Saudi Aramco.

1.2.2. Complexity of Knowledge System Requirements of Organisations

Knowledge infrastructure can be described based on three important aspects. The first of these is a culture which needs to be understood before implementing knowledge management. An organisation's knowledge management policy may fail if the organisation does not develop a knowledge management strategy. It requires a competent organisational culture that focuses on the function and worth of knowledge in daily trade choices and organisation requirements (Allee, 1997). A competent organisational culture must encourage people to award creativity, learning, investigation, inspection and contemplation (Allee, 1997). Organisations need to encourage a culture that motivates people to gather, develop, transfer and utilise knowledge. Currently, organisations are involved in generic endeavours to alter the institutional rules and beliefs linked to knowledge. Successful knowledge management needs a suitable fit within the existing organisational culture of the organisation and its knowledge management schemes. Organisations can integrate knowledge management into their current organisational culture.

Another important criterion for developing knowledge infrastructure is planning, executing and envisioning a successful strategy (Singh *et al*., 2011). The actual basis in knowledge

management strategy is to develop a setting that controls the organisation's intellectual property and helps employees use it from a mutual platform; e.g., on early 2011, Saudi Aramco invested in a KM solution called Sharek; which played the main role of supporting the KM initiatives. Employees could connect to the communities of their interest and share knowledge, problems and solutions (Alsereihy et al. 2012, p. 223).

However, this system did not achieve organisation-wide implementation and is currently not functional. Thus, knowledge management is also implementation related and not related to the mere gathering and merging of knowledge. Knowledge management also provides insight into what an organisation is aware of in terms of tacit knowledge.

Technology is the second important consideration that adds to the complexity of the endeavour proposed in this study. Technological infrastructure is a key facet of knowledge management and can be used to handle knowledge successfully. It the machinery that drives the trend towards improved knowledge management and is central to its evolution. Current information technologies allow for knowledge management and widespread sharing of information. Intranet networks can be used to set up virtual meeting locations whereby members of defined groups can exchange information with one another (Chang *et al.,* 2012). Exchanging information allows greater dispersion of knowledge in the organisation and can contribute to further knowledge generation and sharing. Activities like the development of information, searching for information and comprehending information can be effectively executed in such settings. To assist in this respect, local intranet networks must be planned to handle both informational requirements as well as human-interaction related requirements.

1.2.3. Furthering the Research on the Development and Implementation of Assessment Models

Knowledge assessment models are constituted of methodologies, models and measurement frameworks which are appropriate for improving the competencies of an organisation for knowledge resource measurement. Since knowledge assessment models are interlinked with Knowledge Management, one of the important motivations for this study is the furthering of research in the implementation of such models. Many of the proposed assessment models concern Intellectual Capital (IC). The modern-day classifications of Intellectual Capital as a resource in research divide all IC into structural (internal) capital, human capital and customer-related (external) capital (e.g. Roos *et al.*, 1997; Stewart, 1997).

A number of the newer assessment models such as the balanced scorecard (Edvinsson and Sullivan, 1996; Kaplan and Norton, 1992; 1996; 2000); the Skandia value scheme

(Edvinsson and Malone, 1997) and the intangible asset monitor (Sveiby, 1997). Several of the models above are made up of three major classes of intellectual assets – structural, customer and human capital. All the highly-implemented models used for assessment of human assets and IC stress that the financial measures have to be taken together with non-financial measures to provide a holistic assessment. The various forms of knowledge assets have to be considered for strategic evaluation and implementation such that relevant attributes are available for both measurement and assessment. Several of these models see intellectual capital as an intangible, i.e., it is an essential aspect of employee value and that this provides opportunities for later organisational achievements.

It is also essential to note a research gap that conventional accounting traditions do not make provisions for the determination and quantification of a number of intangibles such as the intellectual capital of an organisation given the very nature of this kind of knowledge. However, as a result, such forms of knowledge are often overlooked or under-addressed. As a result, the most recent of measurement models recommend that an organisation-level analysis is carried out that combines assessment of non-financial and financial value producing areas of the organisation for external correspondence.

1.2.4. Knowledge Loss

Nowadays, knowledge is the organisation's most valuable resource (Grant, 2002). Knowledge loss usually takes place in an organisation when staffs exit an organisation or due to employee's turnover; hence, the organisation loses their human capital and accumulated knowledge (Grant, 1996). Saudi Aramco is implementing a share point among its employees through a system called Sharek through its intranet for all employees to share and contribute knowledge and for the employees turn over the company has implemented a knowledge transfer system to prevent knowledge loss.

1.2.5. Knowledge Management

The KM trend in Aramco and other companies was started to attempt to make sure knowledge is retained and shared within the company. Therefore, it is in the interest of organisations that knowledge as a resource is both gathered as well as utilised effectively. Knowledge Management refers to the host of processes towards this objective at an organisational and individual level. The unit of analysis of enhanced knowledge management in an organisation will be the increased rate of competitive advantage (Halawi *et al.*, 2005). Darroch (2005) defined the primary role of KM as allowing the spread of knowledge amongst individuals in an organisation so that peers and colleagues may utilise it. Thus, the effective sharing of knowledge is central to KM.

This view of KM as a host of processes by Nonaka and Takeuchi (1995) who state that the conversion of tacit knowledge to explicit knowledge takes place through a series of processes. These processes are Socialization, Externalisation, Combination, and Internalisation (SECI) (Nonaka and Takeuchi, 1995). These four processes occur in two phases where the first phase is the 'epistemological' phase and Socialisation is the process by which new tacit knowledge is created through shared experiences (Nonaka *et al.*, 2000). In addition, Externalisation is the process which allows an individual to convert tacit knowledge into explicit knowledge, which then ensures crystallization of knowledge in order for it to be shared with others (Nonaka *et al.*, 2000). On the other hand, combination occurs when processes are applied to convert explicit knowledge into more complex forms of explicit knowledge. Finally, Internalisation is when an individual converts explicit knowledge into tacit knowledge by a process of learning by doing (Nonaka *et al.*, 2000). The latter two stages form the 'ontology' phase of the process (Nonaka and Takeuchi, 1995).

Bhatt (2001) states that Knowledge Management refers to the handling of corporate knowledge and intellectual resources, that can enhance a variety of organisational performance attributes and augment worth by allowing an organisation to work intellectually (Gupta *et al*., 2000). However, this definition of the role of KM raises questions as to which organisational performance attributes should dictate the management of knowledge. While literature provides a host of measures that may be deemed objectively necessary, as financial metrics such as revenue, profits etc., there are a whole host of subjective measures that are thought to be useful as determinants of an organisation's long-term success. Moreover, the objective measures often apply conditionally to the requirements of stakeholders, thus further raising questions in relation to KM as it applies to public sector organisations as they are not primarily profit-motivated. A process-based definition of Knowledge Management can be provided as being comprised of (Becerra-Fernandez *et al.,* 2003):

(i) Recognition of knowledge: This includes ascertaining core skills, identification of tactical skills and knowledge domains; it also includes an evaluation of expertise for all levels and emphasis on reducing discrepancies between the present and required knowledge

(ii) Collection of knowledge: The aim here is to gather the required knowledge from intrinsic and extrinsic sources.

(iii) Furthermore, there is the need to make this knowledge official and record it in a document for further use

(iv) Selection of knowledge: In the selection process, the officially gathered

knowledge is evaluated, and its worth is evaluated.

(v) Moreover, this knowledge is organised and stored in a standardised manner. It is then added to the institutional memory, and reviewed and upgraded on a regular basis

(vi) Sharing of knowledge: The data is segregated and then retrieved from the institutional memory and thus made available for all the knowledge users in the organisation

(vii) Application of knowledge: This includes using knowledge to execute jobs including resolving issues, making decisions, analysing concepts and learning.

(viii) Development: This includes the identification of novel knowledge by employing varied procedures including investigations, best customs, analysis, pilot researches and mining of data.

KM may thus be described as a system of practices (Bourdieu, 1977) that assists organisations to recognise, choose, disseminate and transfer crucial knowledge as determined by the organisation. In this context, a system is considered as being comprised of processes that work together towards a singular goal. In addition, Carlile (2002) has outlined that knowledge is invested in practice and is highly localised (Lave, 1988; Carlile, 1997). In addition, knowledge cannot be separated from an individual's engagement as knowing is embedded with the practice of their knowledge (Cook and Brown, 1999). KM also assists in the choosing, recognition and spread of knowledge (at the individual level) which is an element of the institutional memory at the organisational level. KM allows for the organisation and consolidation of such knowledge for collective access.

1.2.6. Project Allocation of Knowledge Workers

The need to allocate employees to projects based on their knowledge is to ensure they add value to the project. Current allocation practices may be influenced by subjectivity and bias. Currently, the company has no system of which I am aware that will pinpoint a knowledge worker with specific criteria that could be introduced on each organisation in the company. Therefore, I would think that a framework is required to tackle this issue.

1.2.7. Identification of Knowledge Holders

There is no mechanism that would identify a knowledge holder and there is no system for project allocation for knowledge holders. Knowledge workers are defined as workers who possess knowledge as a powerful resource that they apply in their work (Drucker, 1989) whereas knowledge holders are those who hold existing explicit and tacit knowledge. In

order to prevent knowledge loss, manage knowledge effectively, and adequately allocate knowledge workers to projects, there is a need to identify where Aramco's knowledge exists and who are the main knowledge holders in each department.

In addition to the above stipulated motivations, the researcher has a personal stake in this study as he is part of the organisation and wants to enhance KM in the department of Public Relations as well as across the overall organisation. The researcher believes that it is important to develop a measure of the current knowledge that the organisation possesses and locate this knowledge stock so that the right knowledge worker is assigned to the right project. This will inevitably enhance the overall operational performance of the organisation.

1.3. Problem Statement

The lack of an organisational knowledge assessment mechanism to pinpoint a knowledge holder and support decision-making in knowledge management and in the allocation of knowledge resources.

1.4. Research Question

How can individual knowledge be assessed and found in the Public Relations Department in Saudi Aramco?

1.5. Research Objective

These research objectives have been developed in consideration of the research question, following which the study is conducted

Primary Objectives:

a. To assess and pinpoint individual knowledge in the Public Relations Department within Saudi Aramco as a public-sector organisation.
b. To introduce and implement a framework for individual knowledge assessment in Saudi Aramco to support management decisions on knowledge management and project resource allocation and knowledge holders.

Secondary Objective:

a. To learn about the knowledge management process, diagnose problems, performance appraisal, facilitate planning and control, innovate processes and teamwork, and technology adoption in Public Relations Department in particular and Saudi Aramco in general; which are intended to assist in accomplishing the primary objectives.

1.6. Overview of Action Research Methodology

This research is being conducted using an action research approach (Coughlan and Coghlan, 2002). Put simply, the first cycle of action research will be mapping the terrain which will be carried out in two phases. Phase one will be conducted qualitatively and will help the researcher understand what the current state of knowledge management in the organisation is. The second phase will be testing the operability of MinK framework in the organisation for better knowledge management and pinpointing. The second cycle of the action research will comprise of testing the plausibility of implementing MinK in the organisation with the aid of focus groups, consisting of the executive management team at Saudi Aramco. MinK, a novel integrated framework for individual knowledge assessment in organisational contexts, has been used in this study. MinK uses a range of quantitative techniques to collect and analyse knowledge assessment data to produce comprehensive results.

1.7. Limitations of this Study

I have acknowledged the following limitations concerning the study, which could have impacted my ability to achieve a more accurate conclusion:

- ☐ The study is conducted in only one department of Saudi Aramco's hundreds of departments. Thus, the results could be not an accurate representation of the whole company—even though, all departments are adhering to one corporate system.
- ☐ The methods used in the study could be criticised assubjective and based on the decision of the researcher in terms of the selection of the Public Relations Department (PRD) but not another in the company.

1.8. Structure of thesis

The structure of the thesis portrays the different chapters into which the study has been divided. A short introduction is provided here about each chapter.

a. Chapter 1: Introduction- This is the first chapter of the study where a brief introduction to the study is provided, followed by the motivations for developing it. The research objectives and question have been formed in this chapter, in accordance with which the entire study has been conducted.
b. Chapter 2: Literature Review- This chapter compiles the literature review as it pertains to the study wherein, relevant information and research question and objectives are being met. Peer-reviewed papers, established journals, articles or books were used to complete this chapter.

c. Chapter 3: Research Methodology and Methods- In this chapter, the various methods or techniques used to collect the relevant data, carry out the analyses and complete the study are discussed. Also, the different tools used in the study have been discussed here while highlighting the research ethics taken into consideration.
d. Chapter 4: Findings, Analysis, and Discussion of Qualitative Findings- This chapter presents the results of the interviews carried out to identify the need for the implementation of a KM framework in Public Relations Department in Saudi Aramco as well as of the operability of the MinK framework.
e. Chapter 5: Testing the feasibility of implementing MinK framework – This chapter outlines the results of the focus group that was conducted with the executive management team of Saudi Aramco which tested the feasibility of implementing MinK across the organisation.
f. Chapter 6: Research Conclusion and Suggestions to Practice- In this chapter, the study is concluded as per the discussion made on the basis of the analyses carried out as detailed in previous chapters. Besides that, recommendations were also provided in this chapter, to allow Saudi Aramco to benefit from incorporating knowledge management and its various aspects. Ultimately, an action plan with suggestions is introduced to improve individual knowledge (IK) by implementing MinK Framework.

2. Literature Review

2.1. Introduction

Since the time that knowledge has been seen as an essential driver for creation of value, and leading economic growth, the concept of knowledge management has gained attention from several researchers (Drucker, 1994). This increased attention has been the result of the resource-based view of the organisation which was introduced by Penrose (1959), and which states that organisational resources when managed strategically can lend a competitive edge to the organisation. The idea proposed by Penrose (1959) was then elaborated by Barney (1986, 1991) who stated that the organisation's resources are valuable and cannot be easily replaced. An extension of the resource-based view has led to the development of the knowledge-based view which assumes that knowledge is the most important strategic resource for an organisation (Grant, 2002). Here, the organisation is considered to be in a state of constant of flux in terms of knowledge application and creation (Spender, 1996). The current global market conditions require organisations to outperform their competition consistently which can be achieved by the creation of and management of knowledge in the organisation (Holsapple and Joshi, 1999). Therefore, Teece and Nonaka (2001) and Teece (1982) have noted that knowledge and its appropriate management leads to sustainable competitive advantage in the global marketplace.

This chapter presents an extensive literature review of the KM domain and focuses on knowledge assessment frameworks. Different KM research streams are classified in a comprehensive taxonomy and the main approaches to developing knowledge assessment measures are identified. Furthermore, the various frameworks are touched upon and the MinK Framework is explained in detail. This chapter also points out the limitations and the research gaps.

2.2. Knowledge-Based View of the Organisation

Before discussing the knowledge-based view of the organisation, it becomes important to critically evaluate its theoretical precursor which has led to the development of the knowledge-based view of the organisation: the resource-based view. The resource-based view can be defined as the perspective that states that an organisation is a collection of resources that are rare, valuable, and assets that cannot be replaced or imitated (Barney, 1986, 1991; Peteraf, 1993). Therefore, according to this view, organisations with superior resources will gain a competitive edge over other organisations with fewer resources (Penrose, 1959; Conner, 1991; Wernerfelt, 1984; Teece, 1982; Mahoney and Pandian, 1992). Furthermore, Bromiley and Rao (2016) have outlined that the resource-based view

makes predictions that organisations will be different from one another and that the differences will lead to an enhanced performance.

However, as a critique of the resource-based view, much empirical research has been carried out which is primarily focused on how the organisation can maintain their resources as a means of gaining a higher competitive advantage (Barney, 1991; 1986; Peteraf, 1993; Wernerfelt, 1984; Amit and Shoemaker, 1993; Dierickx and Cool, 1989). While the focus of the resource based view is that of enhancing the competitive advantage in the organisation, and the empirical research exists, as noted above, the resource based view cannot be proven hypothetically (Bromiley and Rao, 2016). In addition, it was noted by Teece et al. (1997) that the resource-based view, while dealing with the dynamic capability of the organisation, instead fails to explain how the organisation is supposed to build the resources in a changing environment. Furthermore, there is very little reported on how an organisation should accumulate or build its resources (Levinthal and Myatt, 1994) except in the case of strategic decision-making, product development and building alliances (Eisenhardt and Martin, 2000).

However, despite the wide number of critiques that the resource-based view has faced, it has overcome the challenges (Barney et al., 2001, 2011). For instance, one of the primary challenges that the resource-based view faces is its treatment of time (Priem and Butler, 2001). In other words, the resource based view is critiqued on the basis that it does not adequately address the time element which results in a static view (Priem and Butler, 2001). For addressing this issue that has been raised by past studies, the concept of dynamic capabilities has been added to the resource-based view (Teece et al., 1997) which has helped the resource-based view adjust to the dynamic environment of the organisation and its resource accumulation process. Following from this is the understanding that an organisation must consistently engage in resource accumulation and build up its capabilities in order to maintain the competitive advantage in the market (Teece, 2007; Sirmon et al., 2011; Wernerfelt, 2011).

Furthermore, authors Bromiley and Rao (2016) have highlighted that one of the concerns surrounding the resource-based view is that competitive advantage cannot be adequately measured by studies. However, it was noted by Hitt et al. (2016) that the recent studies such as Sirmon et al. (2011) have used the variable of value generation for customers which indirectly leads to competitive advantage. In addition, it has been noted by D'Aveni et al. (2010) that organisations need to generate competitive advantage at a smaller rate continuously. This causes an increased rate of dynamism in the environment which leads the organisations to consistently engage in ensuring that they are on-par with their competitors

which then leads them to upgrade their capabilities (Derfus et al., 2008). Hitt et al. (2016) noted that in this case, organisations undergo benchmarking as a consequence of continuous capacity building, where they are almost comparable to their competitors and which leads them to re-engaging in recombining their resources to create new capabilities and resources. This generates a continuous cycle in which organisations are engaged in enhancing their competitive advantage.

In addition, the resource-based view has been used to explain the differences that exist within organisations of different sizes. In other words, the resource-based view can be used to explain why organisations of different sizes differ from one another in terms of competitive advantage and can be used to recommend ways in which organisations of different sizes can generate and maintain competitive advantage (Hitt et al., 2016). Therefore, while there are limitations to the resource based view, the perspective is based on sound theoretical background and has overcome the many challenges it has faced.

Since knowledge is a resource, it can be managed, used, and leveraged to gain more competitive edge in the market (Darroch, 2005). Therefore, based on the resource-based view, knowledge is a resource that can be managed. According to this view, knowledge can be thought of as being a coordinating mechanism (Nelson and Winter, 1982) which leads to the development of other resources and capabilities in the organisation. This process of routinization is operationalised as the processes and resources that allow the organisation to achieve the organisational goals (Grant, 1991). Routinization, as indicated by Nelson and Winter (1982) are described as being activities that have a repetitive pattern about them. These repetitions then lead to the accumulation of knowledge in tacit forms and results in a somewhat automatic response to external stimuli (Gong and Shang, 2018). In addition, Nelson and Winter (1982) also noted that this coordinating mechanism allows individuals to also understand and react to the information that is flowing within the organisation. In modern terminology, these coordinating mechanisms can be referred to as knowledge management systems. Based on this view, several studies have found that knowledge management, when done effectively, has led to an enhanced competitive advantage for the organisation along with financial performance enhancements, increased rate of innovation, and better rate of organisational learning (Conner and Prahalad, 1996; Antonelli, 1999; Nonaka and Takeuchi 1995; Buckley and Carter, 2000; Carneiro, 2000).

The extension of the resource-based view of the organisation led to the development of the knowledge-based view of the organisation (Grant, 2002). Based on this view, knowledge is considered to be the most important resource in the organisation and the primary source of

what are called the Ricardian rents (Grant, 2002, 1996). Furthermore, the knowledge-based view is also concerned with the transferability of knowledge. For instance, it can be stated that explicit knowledge is transferred in a different manner than implicit knowledge. More specifically, implicit knowledge, or knowledge that is tacit, cannot be directly transferred and is transferable through experiences making the transfer of knowledge slow and cost intensive (Nonaka, 1994). Moreover, some of the core assumptions of the knowledge-based view are that knowledge is ever-changing and that it is based on experiences and learning (which depicts that this perspective is embedded in the epistemology of possession); knowledge is related to human beings and there are cognitive limitations which then creates the need for humans to specialize into one area; organisations only exist in order to produce new knowledge and to transform that new knowledge into competitive advantage.

The knowledge-based view places a strong emphasis on the role that organisational factors play and outlines that the internal organisation is a complex system composed of various independent actors (Grant, 1996). In addition, the knowledge-based view is embedded in the constructionist theory of knowledge which suggests that knowledge cannot be entirely controlled and only be managed by establishing a few enabling conditions (Von Krogh, 1998). The knowledge-based view supposes that an organisation can generate competitive advantage in the way it uses its resources or knowledge (Grant and Spender, 1996).

The knowledge-based view assumes that organisations are heterogeneous and have knowledge embedded within them (Hoskisson et al., 1991). In other words, according to the knowledge-based view, organisations exist to create knowledge, transfer it, and transform it into a competitive advantage for the organisation (Kogut and Zander, 1992). In addition, the knowledge-based view presupposes that the organisation is a cultural artefact which engages in learning and adapts its practices over the course of time (Balogun and Jenkins, 2003). In addition, Nonaka (1991) states that one of the most important and long-lasting resources that an organisation can possess is knowledge, which leads the organisation to become knowledge-based (Blackler, 2002) and thus create a competitive advantage that is itself knowledge-based (McEvily and Chakravarthy, 2002).

Relatively recent research has led to the conclusion that competitive advantage of an organisation is associated with firm performance that is derived from intangible factors such as technical knowledge or organisational routines (Rouse and Daellenbach, 2002; Dess et al., 1995). This refers to the process of routinisation that was conceptualised by Nelson and Winter (1982). These intangible resources available for the organisation are usually considered to be rare and inimitable (Hitt et al., 2016). However, superior talent is considered

to be the most important factor that leads to sustained competitive advantage and the capacity of the organisation to learn faster than their competitors is viewed as the only necessary and useful form of competitive advantage that leads to greater organisational performance (Hiltrop, 1999; De Geus, 1998).

Organisational learning is considered to be a time-based and time-honoured process by which organisations seek out better ways to manage their internal processes in the organisation (Senge, 1990; Argyris, 1994; De Geus, 1988; Zhang, Macpherson, and Jones, 2006). Once the organisations have developed a robust organisational learning process and culture, they become adept at the management of knowledge by creation, acquisition, transfer, and modification of routines to reflect the new knowledge gained (Huber, 1991; Garvin, 1993). Grant (1991) has noted that organisational learning lends itself to greater strategic management of the organisational resources. However, one of the key aspects of successful organisational learning is the development of processes in the organisation that facilitate change. In other words, organisational learning cannot take place in a rigid organisational system where change is restricted or hindered (Leonard-Barton, 1992). In addition, organisational learning is associated with the creation of a learning organisation, which is when the organisation allows individuals to gain more knowledge and challenge systematic, traditional routines in favour of better routines that can benefit the organisation (Argyris and Schon, 1978). Effective organisational learning needs to have an optimal mix of operational learning and conceptual learning (Kim, 1993).

Here, it is important to consider the concept of organisational unlearning. While the concept of unlearning was developed by Hedberg (1981) who noted that eventually knowledge becomes obsolete and needs to be discarded so as not to cause misinformation, it was further developed by Tsang (2008). The author has defined the process of organisational unlearning as a process of discarding old routines through an intentional process of unlearning. In addition, the author has noted that there needs to be a value judgement on this process due to the fact that not all new routines that have replaced an old routine are always better. Furthermore, Tsang (2008) has also stated that the process of organisational unlearning can occur independently and without the replacement of a new routine. Furthermore, a distinction needs to be made with regards to organisational unlearning and individual unlearning (Tsang and Zohar, 2008). In other words, organisational unlearning happens at the organisational level and can mean replacement of an internal IT software package in favour of a new one, while individual unlearning takes place at the individual level and can represent a scenario where an individual stops a certain practice after realising that it is unnecessary or not useful. One of the core aspects of organisational unlearning, as can be

seen from the above discussion, represents a voluntary realization, on part of the organisation or individual, that the knowledge that is being used and the practice that is being carried out is no longer beneficial (Tsang and Zahra, 2008). In addition, for organisational unlearning to effectively take place, it needs to begin with individual unlearning. In this aspect, Cegarra and Sanchez (2008) have created an organisational unlearning framework which is comprised of three dimensions: change in the perspective of an organisation, gathering of new information based on emergent changes, and a framework for implementing change at the individual level. Therefore, the organisational learning (and unlearning) capabilities of the organisation are one of the most important capabilities that lead to the generation of sustained competitive advantage and performance for the organisation (DeNisi et al., 2003) because these capabilities are inimitable and unique to a particular organisation (Rugman and Verbeke, 2002).

In conclusion, organisational knowledge is one of the most important factors that leads to the generation of increasing returns for the organisation. In other words, knowledge is a resource that, when consumed, leads to a greater value generation rather than reduction (Spender, 2002). Furthermore, an important aspect of the knowledge-based view adopted in this research, is the integration of the knowledge in the process of production (Grant, 1997). In addition, the relationship that exists between knowledge and competitive advantage is dependent on the organisation being able to apply and integrate the knowledge into its processes (Matusik and Hill, 1998). In other words, it can be noted that that an effective knowledge management and retention process is required because the capacity of an organisation to replicate its knowledge and apply it to processes is also an organisational capability (Winter and Szulanski, 2002). Before exploring knowledge management, it is important to understand the nature of knowledge as having the potential to allow the organisation to move towards the explication of knowledge. The two primary views on the nature of knowledge: epistemology of possession and epistemology of practice, need to be considered.

2.2.1. Definition of Knowledge

The definition of knowledge has been the central topic of debate for many centuries. A commonly accepted concept of knowledge that has come from Zack (1999) who describes it as a process starting from data, then moving to information and then culminating in knowledge. In other words, knowledge can be defined as the information that is developed through data or experience and used as a guide to develop action. In addition, Moteleb and

Woodman (2007) have defined knowledge as meaning that is added to the data and hard facts. A similar definition was provided by Van der Spek and Spijkervet (1997).

While the above definitions are used widely to define knowledge, Faucher et al (2008) have stated that these definitions do not allow for distinction between information and knowledge. On the other hand, Tuomi (1999) has suggested that data does not lead to knowledge but rather that a predetermined knowledge leads to effective data processing.

Considering the definition of knowledge, Dretske (1999) states that knowledge is produced from raw material which is obtained in the form of information while Zack (1999) defines knowledge as being a collection of information obtained in the form of data or facts and which is organised in a meaningful manner. Davenport and Prusak (1998) have defined knowledge as the combination of values, experiences, and context in which the experience occurs, and the information that is provided by experts which creates a lens through which an individual processes new information. These authors have provided the link between knowledge and affirmative action which is to say that there is a direct link between knowledge and taking decisions (Diakoulakis et al., 2004, Webb, 1998). A similar definition, one that resonates with the view of knowledge facilitating decision making, has been derived by Senge et al. (1999) who defined knowledge as the "capacity for effective action". In addition to these definitions, Greeenwood (1998), in agreement with the resource-based view, states that knowledge is information which is valuable for any given organisation. Webb (1998), in this context, has outlined that data, information and knowledge work together and generate the capacity of action within an individual. In line with this, Grover and Davenport (2001) have noted that people who possess knowledge have the ability to act upon it and apply it in any given context within their experience or judgement. Furthermore, Joia (2000) has stated that knowledge is founded in the capacity to take action and, as such, is embedded in an individual intuitively and is hard to define, but at the same time, it is linked to the experience and values that the individual holds. Therefore, it can be said that there are two broad schools of thought in regards to the definition of knowledge: one considers knowledge at the top of the hierarchy of data and information, while the second considers knowledge in terms of the process of application. Following the above various schools of thought, several other definitions have emerged of knowledge over the past several decades. Carlsson et al. (1996) have stated that knowledge in an individual can be said to the capacity of influencing an action. Von Krogh et al. (2000) have defined knowledge as the ability of sense-making in any given situation and then adjusting the actions accordingly.

Tsoukas and Vladimirou (2001) have defined knowledge as the process of separating the actions of oneself based on the situation or context at hand. Alvesson and Kärreman (2001), on the other hand, have defined knowledge as being "ambiguous" in nature, which is also a process that cannot be defined or characterised specifically and which has its roots in action, comprehension and theory.

From the above definitions that are presented, it can be said that there is no clear consensus on the definition of knowledge, but a theme of using experiences and information to facilitate decision making is evident. In almost all of the definitions of knowledge that are presented above, the final end result is decision making, acting or influencing an event. All in all, it can be said that knowledge, through an ambiguous process, facilitates an appropriate action in a given situation and a given context. Differentiating between knowledge and skills, it can be said that skills are abilities that an individual possesses and which can be honed with practice (Shipp, Lamb, and Mokwa, 1993).

Having discussed the meaning of knowledge, it is worth exploring the various dichotomies that exist with respect to knowledge. These dichotomies are crucial in knowledge management. Heisig (2009) has presented 28 dichotomies from which the most commonly accepted is the tacit and implicit knowledge dichotomy. In addition, one of the dichotomies outlined by Heisig (2009) is the individual and organisational dichotomy which can be considered to be of particular interest to the field of knowledge management. In this study, emphasis is placed on individual level knowledge rather than organisational knowledge.

Tacit knowledge can be defined as the sum total of the experiences that an individual has gained which cannot be articulated clearly (Grant, 2007). On the other hand, explicit knowledge is an external database of information that is tangible and can be printed, read, and stored (Stevens et al., 2010). The dichotomy between tacit and explicit knowledge can be further elaborated by considering that explicit knowledge can be converted into or transferred via data, formula, manuals or specifications whereas tacit knowledge is personal values, individual differences which cannot be transmitted efficiently (Webb, 1998; Civi, 2000).

It is important to note that tacit and explicit knowledge are not mutually exclusive and work together in varying degrees to generate the desired outcome (Spender, 2015). In addition, Edwards (2015) also stated that tacit knowledge can be found at the centre of knowledge and explicit knowledge forms the fence around the centre. This can be understood by the following examples: driving a car will require more tacit knowledge in comparison to explicit knowledge, whereas the completion of a legal procedure will require more explicit

knowledge in comparison to tacit knowledge. In addition, an almost balanced use of tacit and explicit knowledge is also possible. For instance, in the making of furniture, the individual will use both explicit information and tacit knowledge (Edwards, 2009).

Following the above discussion on the interaction between tacit and explicit knowledge, it can be stated that tacit and explicit knowledge work together to create knowledge (Nonaka, 1994) which can then be applied in a given scenario. This goes to show that the line between tacit and explicit knowledge is blurry, porous and flexible (Spender, 1996). This is one of the issues with the dichotomy between tacit and explicit knowledge. Furthermore, Shin et al. (2001) have noted that the dichotomy leads to an overemphasis on tacit knowledge. Understanding the concept and nature of knowledge is not enough unless an effective knowledge management process is established.

2.2.2. Knowledge Management Systems

The need for knowledge management in an organisational setting has led to the rise of knowledge management systems (KMS). Massa and Testa (2009) have stated that KMS can be defined as system that is developed through a collaboration of technical, managerial, and organisational system which is specifically implemented to facilitate effective knowledge management. The authors also stated that KMS is essentially a set of processes designed to facilitate KM.

Seven knowledge processes have been identified by Schiuma and Marr (2001): knowledge storing, knowledge mapping, knowledge sharing, knowledge transfer, knowledge generation, knowledge codification, and knowledge application. Edwards (2015), on the other hand, states that knowledge transfer and knowledge sharing should not be part of the knowledge process. The author has developed a lifecycle of knowledge management which begins with the organisations creating or acquiring knowledge, storing it, refining it or reusing it and in the long term, forgetting it. Forgetting knowledge as a process was added by the author to indicate that some of the knowledge needs to be eliminated by organisations as technological advancements make older knowledge obsolete.

Heisig (2009), from a review of more than 160 KM methods and frameworks, outlined the following processes: creating, identifying, acquiring, sharing, storing, and using. Creating deals with the generation of new technology or processes through innovation and experimentation. Identifying deals with the structuring, reviewing, screening and classifying of knowledge. Acquiring deals with the sourcing and gathering of knowledge from external sources. Sharing deals with the transfer of knowledge, collaboration, allocation and

cooperation. Storing deals with the codification of knowledge, its preservation, and maintenance. Finally, the use of knowledge is by extracting value out of the same and using it to enhance existing processes.

2.2.3. Epistemology of Possession

Newell et al. (2009) have outlined that epistemology of possession represents knowledge as something that is possessed by an individual or an entity in some capacity and which can be applied in an effort to enhance efficiency (p. 3). In this view of knowledge, an individual draws subjective meaning from the data and information that is presented to them. Furthermore, in this view, implicit or tacit knowledge is considered as something that is possessed and which can be transferred to someone else in the form of explicit knowledge (Newell et al., 2009). According to the authors, this perspective of the knowledge as possession is closely linked with the resource-based view. In other words, based on the epistemology of possession, knowledge is considered as a resource that can be stored and transferred to others in an organisational setting. Furthermore, this view of knowledge as a resource means that it can be accumulated, shared, stored, and the more an organisation has the higher profits it can generate (Newell et al., 2009).

2.2.4. Epistemology of Practice

While the epistemology of possession has overcome its challenges, the proponents of epistemology of practice challenge this view (Newell et al., 2009). The authors have stated that the epistemology of practice is in direct opposition to the epistemology of possession. The scholars who support the epistemology of practice start with the assumption that knowledge is developed and gained as a result of a social interaction between two or more individuals (Brown and Duguid, 2001; Lave and Wenger, 1991). In simple terms, where the epistemology of possession is the belief that knowledge is possessed and can be passed on to others as a resource, the epistemology of practice states that knowledge cannot be obtained by any other process than enactment (Newell et al., 2009). As per this belief, the only way an individual can gain new knowledge is by doing or practicing rather than just reading, for instance. The authors have noted that knowledge and practice are embedded in one another. This means that when knowledge is shared, the related practice must also be shared to be able to make use of the knowledge. In this view, knowledge is not always good as if the practice is not adopted, the knowledge is futile. Brown and Duguid (2001) have noted that knowledge sharing cannot be facilitated in specialized areas which have clearly defined boundaries due to the said specialization.

2.2.5. Epistemic view of this research

This research has adopted the epistemology of possession. One of the reasons why this view is adopted by the researcher is that there is a potential for knowledge transfer without having hands-on experience (Newell et al., 2009; Cook and Brown, 1999). Furthermore, the epistemology of possession places a greater emphasis on tacit, individual knowledge (Cook and Brown, 1999) which can then be converted into explicit knowledge (Nonaka, 1994; Newell et al., 2009). Therefore, adopting this view of the nature of knowledge allows the researcher to assume that tacit knowledge which is obtained by an individual through personal experience can be explicated into explicit knowledge which can be shared to a group. Adopting the epistemology of possession allows the researcher to state that knowledge that is possessed by an individual can be identified, extracted, and shared with a group who will then come to possess the knowledge. This will then become an important capability of an organisation as previously stated the ability to replicate its knowledge and apply it to processes is an organisational capability (Winter and Szulanski, 2002). Making this assumption allows the researcher to be able to use the MinK framework as part of this action research to pinpoint the knowledge holder and then facilitate effective knowledge management across the organisation.

2.3. Knowledge Management

An explanation by Bhatt (2001) states that Knowledge Management refers to the handling of corporate knowledge and intellectual resources, that can enhance a variety of organisational performance attributes, and augment worth by allowing an organisation to work intellectually (Gupta *et al*., 2000). Knowledge Management may be described to be a procedure that assists organisations to recognise, choose, disseminate and transfer crucial information. It also assists in the choice, recognition and spread of skills that are an element of institutional memory. This characteristically is found within an organisation in an unorganised manner. Knowledge Management thus permits successful and efficient resolving of issues, dynamic learning, tactical planning and the making of decisions. The emphasis of Knowledge Management is on recognising knowledge, explaining it such that it can be used collaboratively by all officially, and hence can be reused effectively.

Darroch (2005) revealed that Knowledge Management allows spread of knowledge amongst individuals in an organisation so that peers and colleagues may utilise it. Knowledge Management is the technique of executing knowledge-related activities including arranging, limiting, filtering, storing, collecting, sharing, spreading and utilising knowledge entities including data, information, experience, assessments, perceptions, acumen and ideas.

According to David & Fahey (2000), Knowledge Management is essential for organisations as the knowledge that was once relevant in the near or distant past may no longer be applicable in the times to come, as the market finds itself rapidly changing. This is partly owing to the rapid pace of technological development but also due to other economic forces such as globalisation and increased competition. The need to respond to rapid change is also the case in respect to the institutional framework, control and coordination systems, the drive and reward schemes. To remain in line with the actively modifying requirements of the trade settings, organisations require to evaluate their intrinsic trade theories for consistent efficacy consistently.

Knowledge Management requires a tactical dedication to enhance the efficacy of the organisation in addition to enhance the sourcing and exploitation of opportunities by an organisation. Du Plessis (2007) states that Knowledge Management procedure aims to enhance the skill of an organisation to implement its essential procedures in a successful a manner. The objective of Knowledge Management is to consistently enhance the performance of an organisation by enhancing and sharing the institutional knowledge across the organisation (i.e. the objective is to guarantee the organisation has the correct knowledge at the appropriate time and location). Knowledge Management refers to the group of pre-emptive actions to endorse an organisation in developing, collecting, spreading, and using the knowledge. Thus, Gold & Malhotra (2001) conclude in their study that Knowledge Management is a consistent procedure to comprehend the knowledge requirements of the organisation, the accessibility of knowledge and the means to enhance knowledge.

Lyu, Zhou, & Zhang (2016) noted that knowledge is recognised as a central economic resource, a commodity and an organisational asset which is linked to organisational advancement. It also acts as the key dynamic for an organisation's success. Knowledge should be appropriately managed to enhance the organisational performance. Therefore, based on the Knowledge Management research, organisational learning generates superior knowledge base and leads greater organizational performance and sustained competitive advantage (Bontis and Fitz-enz , 2002; Garvin, 1998; Senge, 1990; Miller, 2002).

2.3.1. Knowledge Management Strategy

KM in an organisational context revolves around two: KM strategy and consequently KM structure. One concerns the intention of managing the knowledge ("What are we doing with the knowledge?"); withthe other, another approach is taken – the KM strategy itself ("How do we make it happen?") (Edwards 2015).

The principal choice regarding what to do with the knowledge is between exploration and exploitation: "the exploration of new possibilities and the exploitation of old certainties" (March 1991, p. 71). In other words, what should the balance of effort be between creating/acquiring new knowledge and using the knowledge that the organisation already has? This balancing of the future and the present is a central element of any business strategy, and several organisations get this wrong at implementations.

Almost independent of the exploration/exploitation choice is that of the KM strategy to achieve the exploring and/or exploiting. The essential work on KM strategies is by Hansen et al. (1999), which identified the two fundamental KM strategies as codification and personalisation. The personalisation strategy takes the "knower" viewpoint that the organisation's knowledge resides mainly in the heads of its people (and thus is tacit), and the main purpose of KM systems is to help people locate and communicate with each other. The codification strategy takes the viewpoint that the most relevant knowledge for the organisation can be made explicit, codified and stored in computer format, so that it may be widely shared.

Hansen et al. (1999) suggested that organisations should concentrate on one of the two strategies with at least an 80 - 20 split. Several have challenged this, with one of the most recent even drawing on data from the same management consulting sector (Powell and Ambrosini, 2012). In addition, Nielson and Michailova (2007) have suggested that instead of having a split between two approaches, organisations can apply codification and personalisation strategies in a different way and adapt their knowledge management approach based on changes in resource availability and other demographic characteristics of the organisation. Furthermore, Powell and Ambrosini (2012) have suggested a pluralistic approach to knowledge management with the strategic application of codification and the use of multiple KM approaches to achieve organisational goal. The authors have also considered organisational unlearning, that has been discussed earlier, as one of the core aspects of successful KM in organisations.

One aspect of KM strategy on which there is general agreement is that KM strategy needs to be aligned with business strategy. However, it is intriguing to observe that the Hansen et al. (1999) paper does not specifically refer to any of the literature on business strategy at all. Hansen et al. (1999) identify the two competitive business strategies of standardisation and customisation as fitting with codification and personalisation KM strategies respectively, and thus it is clear that they take a market-driven view of business strategy. Nevertheless, these two business strategies do not exactly match the best-known exposition of market-driven business strategy, that of Porter (1980).

Whichever KM strategy is adopted, an essential element of monitoring that strategy is to be able to measure its effectiveness. Accountants and others have been grappling with the issue of trying to measure knowledge, or the effectiveness of its management, for the past 20 years. A pioneer in this field was Sveiby (1997). His work and that of others (Edvinsson and Malone 1997; Roos and Von Krogh 1997) have led to the field now known as intellectual capital research.

2.3.2. Intellectual Capital

Knowledge management (KM) and intellectual capital (IC) are believed to influence each other, and the relationship between the two constructs is of vital importance to organisational effectiveness. While a two-way relationship between KM and IC is conceivable, the relevant empirical research has yet to produce satisfactory evidence on the nature of the relationship between the two constructs (Seleim and Khalil 2011).

IC of a company can be defined as "the sum of the knowledge of its members and the practical translation of this knowledge" (Roos et al. 1997: 27) into organisational action. From a financial perspective, the IC concepts define the market value of a organisation as the sum of financial and intellectual capital (Edvinsson and Malone 1997; Sveiby 1997; Stewart 1997; Roos et al. 1997).

Finally, knowledge comprises both the stock aspect of intellectual assets and the flow aspect of interchange among those assets. This distinction additionally can be linked to the 'western perspective' that relies mainly on explicit knowledge, while the Japanese approach to knowledge considers a tacit dimension of knowledge in organisations (Nonaka 1988, 1991; Nonaka and Takeuchi 1995). Elaborating on the concepts of knowledge stock and flow as outlined above, it can be said that knowledge stock is the amount of knowledge, skills, and abilities that the intellectual capital of an organisation possesses (Wright et al., 2001). As organisations engage in the hiring of more personnel, their apparent knowledge stock increases due to differences in the knowledge and training of the organisation's workforce. On the other hand, the concept of knowledge flow represents the flow of knowledge among employees in the organisation during work processes and routines (Collins and Smith, 2006). The quality and intensity with which knowledge is exchanged will determine the innovative capacity of the organisation (Subramaniam and Youndt, 2005). Bolisiani and Oltramari (2012) have stated that the phenomenon of knowledge stocks and flows is based on a traditional transaction model in which appropriate knowledge assessment mechanisms can be applied to assess the flow of stock from one individual to another.

Several of the present methods of measuring intellectual capital and knowledge assets are inspired by studies and traditions within the fields of intellectual property, economics, real options, accounting and human resource accounting etc. Previous reviews of these models have concentrated at a company level analysis using an economic, strategic or accounting viewpoint (Housel and Bell 2001, Sveiby 2002, Liebowitz and Suen 2000). Several of these models have not been applied directly in the evaluation of national information assets. Several empirical studies, as well as institutional policy structures, however, make inferences to the major elements of the models within their conceptualisation. Despite higher awareness regarding behavioural and social issues important to national functioning, interestingly, there is little focus on combining the behavioural and sociological perspectives. One aim of this research is to investigate models and the ways in which we can modify their major factors in agreement with the focus of the public sector on general national development and growth.

2.3.3. Knowledge Assessment

Knowledge Management in an organisation enhances the productivity of employees. What follows is an elaboration on the knowledge assessment approach which is used to collect the information regarding productivity. For this, Alavi & Leidner (2001) noted that companies can use a questionnaire survey or interview the targeted group to collect information or knowledge from them and measure their productivity. In order to measure the extensive work on knowledge assessment which spans decades, the tool of knowledge work productivity assessment or KWPA is identified.

Gold & Malhotra (2001) commented that the knowledge assessment through this tool is measured by including the responses gathered from the employee interview process and questionnaire survey method. The tool is also essential to identify the possible issues in Knowledge Management and sharing.

2.4. Knowledge Assessment Models and Frameworks

This section's main focus is to review and provide appraisal of a number of the common measurement models and frameworks for measuring intellectual capital and knowledge assets (Malhotra, 2003).

The measurement or assessment of intellectual capital and knowledge is a complex process due to the inherent fluid nature of knowledge (Kankanhalli and Tan, 2005). As has been briefly explored in the previous sections that intellectual capital and knowledge influence one another, the KM assessment measures are focused on identifying the intellectual capital.

There are two primary aspects of intellectual capital or knowledge assessment: internal and external.

When looking at the internal aspect, it is considered that the decision makers in an organisation may be oblivious to their organisation's intellectual capital and hence, these assessment models seek to identify the seemingly unknown or untapped intellectual capital (Edvisson, 1997). In contrast, when evaluating the external aspect, the evaluation is done by measuring the intangible assets that a company has developed (Lev and Feng, 2011).

Combing the internal and external perspectives, there are three primary categories of knowledge measurement methods: Financial Methods, IC Scorecard methods, and Performance Methods.

2.4.1. Financial Methods

The financial methods deal with primarily an external aspect where they quantify a company's intangible assets and derive the value of the intellectual capital by looking at the financial performance.

Some of the frameworks of assessment are: Tobin's Q, Economic Value Added, Human Resource Accounting, and Value Creation Intellectual Coefficient.

Tobin's Q (Tobin, 1969) is a framework that is used for the evaluation of the investment decisions of an organisation. This tool calculates the ratio of the company's investment's market value in relation to the book value. However, this ratio has been criticised for being an inappropriate measure for intellectual capital as it is based on market fluctuations (Lev and Feng, 2011).

The Economic Value-Added framework measures the shareholder value and calculates the intangible assets from the balance sheet of an organisation (Stewart, 1994). However, the primary drawback of this framework is the fact that this framework does not yield a direct value of intellectual capital but is rather based on the assumption that an increase in the economic value added will necessarily mean an increased intellectual capital (Chen et al., 2004).

Human Resource Accounting is the framework which uses financial data to assess the human capital of an organisation (Flamholtz et al., 2002). However, according to Mayo (2001), the reliability of this method is low as it is based on some assumptions such as the forecasted revenue of the organisation.

Finally, Value Creation Intellectual Coefficient measures the value generation that is taking place in the organisation by its use of the financial capital and the intellectual capital (Pulic, 2000).

2.4.2. IC Scorecard Methods

Luthy (1998) stated that the IC scorecard method divides the financial capital that an organisation has and the knowledge and intellectual capital that the organisation possesses and evaluates them separately. Here, the process is broken down into four aspects that begins with the classification of the intellectual capital, then moves onto developing the measures which will be used to evaluate this classified intellectual capital; once the measures are developed, they are categorised into numerical figures, and then the financial valuation is carried out.

The intellectual capital is usually classified into three categories (Stewart, 1998): human capital, relational capital and structural capital. Human capital is the knowledge and information that employees bring to the organisation and is a crucial knowledge resource for the organisation (Luthy, 1998). Structural capital, on the other hand, is the tangible resources that an organisation provides its employees in order to facilitate their work (Kannan and Aulbur, 2004). Relational capital is the capital which is the strategic relationships that the organisation has developed with its external third-party partners (Roos et al., 1998).

The measures that are developed for the evaluation of the classified intellectual capital range from counts to percentages and ratios. Then the values are aggregated under a weighted average to measure the intellectual capital of the organisation.

There are several methods or frameworks using this method: Skandia Navigator, Intellectual Capital Index, Technology Broker, Intangible Asset Monitor, IC Rating, Value Chain Scorecard, Intellectual capital statement, global competitiveness assessment, knowledge assets map, and IC statements. Most of the frameworks, more or less, follow a similar process with some differences between them. For instance, some of the frameworks use financial valuation and some do not. Others classify the intellectual capital in a different manner.

Discussing all of the above listed frameworks is out of the scope of this study as it will not serve any significant purpose to this study. Hence, the attention is moved to the next classification which is the human capital methods.

2.4.3. Human Capital Methods

The Human Capital methods are focused on how important the human capital is for the intellectual capital or knowledge of an organisation (Bontis and Fitz-Enz, 2002). Some of the frameworks in this method are Human Capital Index (HCI), Human Capital Monitor, Human Capital Hierarchy of Measures, and Human Capital Readiness.

2.4.4. Key Takeaways

While the above-mentioned frameworks have been widely used for measuring intellectual capital, one of the key challenges is that some of the frameworks allow for internal reporting and not external reporting. In addition, it has been understood that organisations do not disclose their intellectual capital to third parties, especially in the case of a declining intellectual capital and knowledge. This is due to the intense competition that is prevalent in the market. In addition, Ragab and Arisha (2014) have stated that the external methods are not always reliable. Furthermore, the authors also noted that there is an issue where the more general a framework is, the likely it will be difficult to adapt.

2.4.5. Balanced Scorecard

The Balanced Scorecard is a commonly used and applied framework for assessing performance (Olve et al., 2003) that has been developed by Kaplan and Norton (1995). The benefit of this framework is that it allows the organisation to measure performance from four key parameters such as financial, professional development, customer service, and internal processes. However, this framework has one key limitation: it does not allow the measurement of knowledge or intellectual capital.

2.5. MinK Framework

The MinK framework that forms the basis of this thesis is a recent model that is pertinent to knowledge management in organisations based on individual knowledge indications (IKIs). The key advantage of the MinK framework is that it is generally applicable to all organisations (Ragab and Arisha, 2014). The basis of this model is the set of processes in the SECI model (Nonaka and Takeuchi, 1995) discussed as follows:

• Socialisation (S) – “conversion of tacit knowledge into other forms of tacit knowledge through social interaction and dialogue with other individuals” (Ragab and Arisha, 2014).

• Externalisation (E) – “conversion of tacit knowledge into explicit knowledge through narratives and analogies to convey an individual’s conceptualisation to others” (Ragab and Arisha, 2014).

• Combination (C) – "conversion of explicit knowledge into other forms of explicit knowledge through codification and documentation" (Ragab and Arisha, 2014).

• Internalisation (I) – "conversion of explicit knowledge into tacit knowledge within an individual through learning and experience" (Ragab and Arisha, 2014).

The individual knowledge indicators (IKIs) utilised in this model are: Education, Experience, Training, IT Literacy, Business Communication, Business Process Interactions, Personal Network, Performance, Creativity & Innovation, and Remuneration. These IKIs in the MinK framework fall under four groups: Knowledge Stock, Knowledge Flow, Utilisation and Knowledge Market Value. The MinK model assessment requires a combination of quantitative and qualitative approaches in the measurement of Individual knowledge. The quantitative metrics include: 1) the count of years of experience, 2) hours spent in training, and 3) financial value of remuneration. The subjective metrics (in the form of ratings) include 1) performance, 2) innovation, and 3) networking capacity (Ragab and Arisha, 2014).

2.5.1. Benefits and Limitations of Using MinK

The choice of the MinK framework has to do with the fact that it has been developed on the basis of many established frameworks that measured organisational knowledge. The need for measuring individual knowledge has been identified. MinK is the only framework that has been developed for measuring individual knowledge and for ensuring appropriate knowledge management in the organisation. In other words, the MinK framework is measuring individual knowledge and is helping in the identification of the knowledge stock in an individual for the organisation to use. The limitation of this framework is its novelty. Thus far, this study is the first use of the MinK framework in academia and as such prior research on the operationalisation of MinK framework does not exist. Another limitation of the MinK framework is that it is focused on measuring the explicit knowledge in an individual. Finally, the MinK framework is embedded in practicality as it was developed for organisations to use instead of the various KM tools that exist.

2.5.2. Mink Scorecard

In planning knowledge evaluation models, Lerro and Schiuma (2013) recognise two methods of "evaluation architectures." Promoted by the BSc, a *scorecard-based architecture* classifies the key areas of evaluation then describes necessary procedures for each of them, therefore, providing comprehensive information about the model being measured. *Index- based architectures*, on the other hand, purpose to provide combined information to contribute a complete image of knowledge. MinK embraces a mixture of

architecture that incorporates both approaches by aligning areas of assessment through the MinK Scorecard, then suggesting an approach for the consolidation of measures to gain a collective index. Based on the proposed theoretical model, the *MinK Scorecard* (Figure 4.2) classifies individual knowledge assessment into four extents that are measured by four groups of indicators: *Knowledge Market Value Indicator (KMVI), Knowledge Stock Indicators (KSI), Knowledge Flow Indicators (KFI) and Knowledge Application Indicators (KAI).*

Primarily, KSIs attempt to evaluate the knowledge stockpiles individuals have collected through both experiential and formal learning. They mirror previous knowledge individuals have learnt and adopted. The hypothesis is that such indicators will measure "enabling factors" that govern the person's capability for the creation and taking advantage of knowledge (Bolisani and Oltramari, 2012).

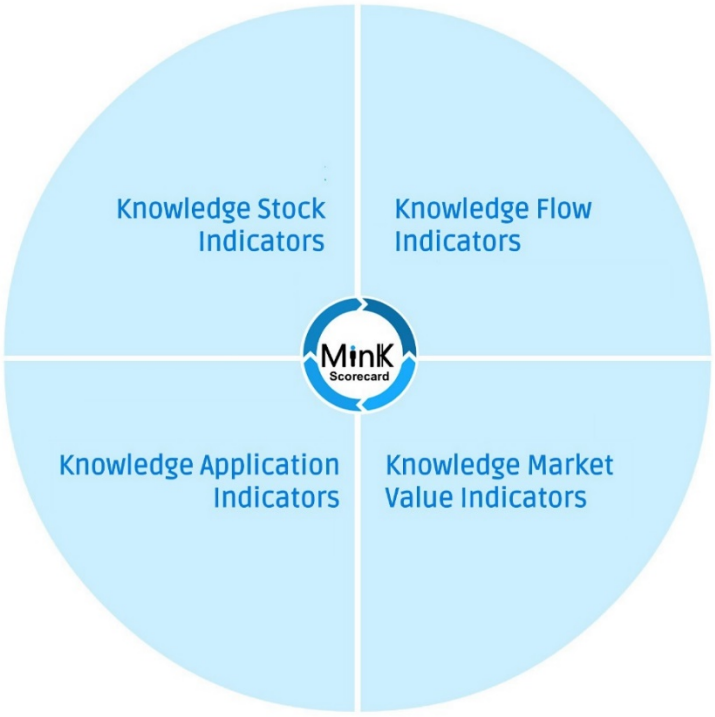

Figure 2.1: MinK Scorecard

Source: MinK Conceptual Framework (Ragab and Arisha, 2014)

On the other hand, KFIs mirror an individual's exposure to knowledge streams and their possible roles in the drives of the organisation's knowledge achievement and transmission. Individuals steer knowledge flows by generating, obtaining and sharing knowledge via communication with internal and external stakeholders. They also organise a lot of their knowledge into business structures and procedures, which permits such knowledge to be learnt by other staffs in the same establishment. It is presumed that knowledge-holders

would be highly involved in business procedures and shared communication with their social networks.

Based on the supposed connection between a person's knowledge and its impact on their contribution and creativity, KAIs concentrate on the knowledge implementation process in which employees place their knowledge into action to generate value. Since knowledge is the groundwork for ability and action (Grant, 1996), KAIs are indirect processes that concentrate on assessing the *influence* an individual's knowledge has had on their work.

Moreover, the IC assessment literature has created a bond among market value and knowledge, in which the value of IC is counted as the alteration between a company's book value and its market value (Luthy, 1998). This sight is based on the impression that there is an intangible value to a company's IC that is mirrored in its market value but is not indicated to in its books. Using a similar approach, the KMVI tries to evaluate an individual's knowledge based on their market value, as mirrored by their compensation package. The hypothesis is that by appointing individual employees to different stages on the company's salary scale, managers indirectly associate a secret value to the knowledge they have and the value they could produce for their organisations. Consequently, an individual's market value (i.e. remuneration) can be utilised as a proxy indicator of their knowledge in an identical way an organisation's market worth is used to assess the value of its IC.

2.5.3. Assessment Constructs

Figure 2.2: Assessment Construct

Source: MinK Conceptual Framework (Ragab and Arisha, 2014)

To operationalise the evaluation of individual knowledge, MinK suggests a number of evaluation concepts, referred to as *Individual Knowledge Indicators (IKI)*, which house the four dimensions of the scorecard. The ten offered IKIs are listed in Table 2.1.

Table 2.1: Assessment Constructs (IKIs)

Category	Construct	Description
Knowledge Stock Indicators (KSI)	Experience (XP)	The degree of an individual's specialised experience related to the job.
	Education (EDU)	An individual's official academic education (e.g. B.Sc., M.Sc., MBA, PhD).
	Training (TRN)	Related internships and training courses an individual has attended during their career.
	IT Literacy (ITIL)	An individual's capability to use IT tools (software and hardware) in business to acquire, create, and share knowledge.
Knowledge Flow Indicators (KFI)	Business Process Interactions (BPI)	The degree of an individual's engagement with business procedures and systems including design, improvement and usage.
	Business Communications (BCOM)	The patterns, rate and nature of an individual's contribution to internal and external business communications through various means (meetings, phone calls, emails, etc.).
	Personal Network (PN)	The value and scope of an individual's network of business contacts.

Knowledge Application Indicators (KAI)	Performance (PERF)	An individual's production at work and overall contribution to their organisation.
	Creativity & Innovation	An individual's capability to offer new ideas and solutions to solve existing problems that might exist.
Knowledge Market Value Indicator (KMVI)	Remuneration (RMN)	The total remuneration an individual receives for doing their duty (i.e. salary) which is considered to be the market value of an individual

Source: MinK Conceptual Framework (Ragab and Arisha, 2014)

2.5.4. Metrics

Figure 2.3: Data Collection Metrics

Source: MinK Conceptual Framework (Ragab and Arisha, 2014)

In order to evaluate different IKIs, information about each concept is gathered in assessable terms using a group of metrics. Metrics are measurement indicators that are used to calculate the personal level among different knowledge indicators by appointing a mathematical value to each concept. Measurement units may be direct calculated, financial values, or percentages when measuring numerical attributes, or mathematical scale-based ratings when used to assess qualitative qualities (Lerro et al., 2012). In order to merge metrics into an index, all metrics should have the same measurement unit, or should be changed into dimensionless numbers (Marr et al., 2004). Therefore, a combined 7-point Likert rating scale is implemented for all metrics. For qualitative qualities (e.g. innovation), the scale range is established as 1 = "very low" and 7 = "very high." In the event of quantitative attributes, an equal score bond is established for each rating. For instance, when evaluating EDU, the equal scores could be: 1 = None, 2 = Middle School, 3 = High School, 4 = Bachelor, 5 = Post-graduate Diploma, 6 = Master, and 7 = Doctoral. The MinK context delivers a list of suggested metrics that work to assess each concept and projected in Table 2.2.

It is agreed, however, that the framework's dependence on knowledge makes it nearly impossible to make a single set of metrics that would be related and applicable to all types of companies (Baron, 2011). The establishment-specific type of knowledge suggests that metrics should be precise for each particular organisation (Veltri et al., 2012). Managers are, therefore, urged to recognise measures that are most related to their organisations by evolving their own group of metrics or adjusting the proposed list matter to their business framework. Adjustments can include the omission of metrics that are unconnected to the company's particular domain and the presentation of others that are designed to the company's commerce area, scope, age and strategy. The designation of metrics mirrors

the surrounded adaptability combined into the outline to solve the related type of knowledge that requires its evaluation *from within* based on the mutual meanings organisation staffs attach to the metrics they consider most suitable. Even though such an approach does not allow inter-organisation benchmarking, it is implemented by some IC measurement models because it improves the precision and significance of the assessment results (Roos et al., 1998).

Table 2.2: Proposed Metrics

Construct	Metrics
Experience (XP)	• Number of years served in the company • Number of years in role • Number of years in the field • Relevance of experience to current job
Education (EDU)	• Degree of education • Significance of education to job • Expertise in different languages
Training (TRN)	• Degree of professional qualifications • Number of training programmes joined • Influence of training on performance
IT Literacy (ITL)	• Ability in general software & hardware • Expertise in company particular software & hardware
Business Process Interactions (BPI)	• Number of procedures used • Capability in using business methods • Participation in business process design • Participation in business process improvement
Business Communications (BCOM)	• Involvement in internal gatherings • Involvement in external gatherings • Rate of related internal communications • Rate of related external communications • (e.g. phone, email, memo, report)
Personal Network (PN)	• Level of contacts within the company • Level of foreign contacts • Relevance of contacts to business • Contact obtaining rate
Creativity & Innovation (C/I)	• Rate of state-of-the-art ideas suggested • Rate of state-of-the-art ideas implemented

Remuneration (RMN)	• Pay scale • Job Tier • Market cost of equivalent services
Performance (PERF)	• Use performance metrics adopted by the organisation.

Source: MinK Conceptual Framework (Ragab and Arisha, 2014)

2.6. Measuring knowledge within organisations

According to Lyu, Zhou, & Zhang (2016), to understand the effectiveness of Knowledge Management in an organisation it is also essential to measure the knowledge at an individual or group level. The Proxy Measure is an important technique which is chosen by the organisational experts to measure the knowledge at a group level. Proxy Measures help to evaluate that knowledge is not articulated, but that a substitution is required to measure it. Group knowledge is measured to map the diffusion of knowledge in an organisation and to find out whether it is affecting work performance or not. River chart is another method which can be used to measure the knowledge progression in a group. This is dependent on the self-evaluation of managing competencies based on a five-point Likert scale. After that, the outcomes are portrayed in the form of a river diagram. The river's width provides clear evidence regarding the amount of knowledge shared or gained by the employees in that particular organisation.

Massaro, Dumay, & Garlatti (2015) state that Knowledge Management at an individual level could be measured while evaluating work performance. It may also be useful in predicting individual work performance at the time of analysing the training needs of a new employee. Khaled, Renukappa, Suresh, & Saeed (2017) suggest that to assess the attitude of an individual towards knowledge sharing, organisations can use a questionnaire survey and gather their views. Techniques like Pathfinder and Repertory Grid can be used to measure the amount of knowledge gathered by individuals. However, to measure tacit knowledge of a person, three basic approaches can be used. These are: a) monitoring the individual's performance during the simulated scenario that is much like a model work situation, b) situational judgment test and c) questionnaire evaluating behaviour. Here, it is important to note that the measurement of tacit knowledge depends on the conceptualization of tacit knowledge that is applied. In other words, several views consider tacit knowledge to be knowledge that has not been codified yet (Davenport and Prusak,

1998; Ambrosini and Bowman, 2001), a conceptualization which considers explicit knowledge to be the opposite of tacit knowledge (Kabir, 2013). On the other hand, another conceptualization of tacit knowledge outlines that because of its tacit nature, it cannot be measured and any attempt to convert it to explicit knowledge is not workable (Kabir, 2013). In addition, this view of tacit knowledge further states that tacit knowledge cannot be codified and reduced to explicit knowledge because the former is contextual and is only relevant in its context (Brown and Duguid, 2001; Cook and Brown, 1999).

Knowledge can be measured by using either financial methods which quantify the intellectual capital (IC) or scorecard methods to measure the components of IC. Intellectual capital is measured to realise the hidden assets while developing it strategically to meet the organisational goals. The financial methods can quantify the IC depending on the accounting evidence. These types of methods can be used to measure the benefits of Knowledge Management. Tools like return on investment, stock prices and profitability are measured to find the required results. Non-financial methods include the interview process or survey methods where the employees of an organisation are questioned to find out whether they have benefited due to Knowledge Management or not.

On the other hand, Kulkarni and St Louis (2003) noted that the balanced scorecard approach is an effective management framework which is used to provide variety of ways of connecting the strategic objectives of a company with the precise measurements. The balanced scorecard process helps in understanding the level of knowledge gathered by an employee due to the knowledge sharing process adopted by the particular organisation.

It can be concluded that organisations should effectively focus on managing knowledge so that they can thrive in the greater business environment in which they operate. Knowledge Management strategies which are adopted and implemented by organisations influence Knowledge Management initiatives. Furthermore, these initiatives are required to be evaluated so that they may align with the strategic goals of the organisations (Massaro, Dumay, & Garlatti, 2015). Therefore, in this regard, it is important to evaluate Knowledge Management through knowledge assessment strategies as discussed in this section of the study, so that the managers can also understand the issues or deficiencies in Knowledge Management. On this basis, managers can provide the appropriate theoretical evidence for continuous improvement. Various models or strategies have been applied by organisations to measure the performance of Knowledge

Management. These include both financial and non-financial methods such as balanced scorecard method. In this regard, McEvoy, Ragab, & Arisha (2016) commented that there are many perspectives regarding Knowledge Management performance analysis.

Different types of methodologies have been proposed by scholars to evaluate Knowledge Management. Some of them have been highlighted in this study. The overarching conclusion of the review provided is that Knowledge Management is one of the important management imperatives which are used to create and maintain competitive strengths as well as innovation in the workplace. The approaches that are used to evaluate Knowledge Management rely mainly on various conceptual frameworks. Therefore, organisations need to choose the right Knowledge Management tools to improve the skills and knowledge of the workforce and at the same time, should measure the level of knowledge of each employee to see whether their level of knowledge has improved over time.

2.7. KM in the Middle East

It is crucial to note that Knowledge Management systems have emerged only of late in the Middle East. According to Kassab (2016), the novelty of knowledge management was recently introduced in the Middle East, transferred by professionals and masters from the Western community. The organisations, on the other hand, must proactively provide training and arrange workshops apart from engaging their staff to help them comprehend the significance of the Knowledge Management systems and the vital role it plays in the growth and sustainment of the organisation. Furthermore, Gold and Arvind Malhotra (2001) add that it is essential to use one phrase for talking about Knowledge Management systems instead of using several words interchangeably to establish it as a paradigm. This minimises confusion and doubt pertaining to what the system means and where the utility of KM lies.

Most significantly, Knowledge Management systems can be beneficial in improving the interaction between individuals and amongst institutional units and levels. Organisations must encourage employees to avoid merely considering Knowledge Management as technical jargon used by novel IT solutions and automation. Knowledge Management is a dynamic and social system and its success chiefly depends on the quality of human communication between individuals, both internal and external to the workplace. The next section will look into the importance of KM in organisations.

2.8. Importance of KM

It is observed that limited government bodies identify the significant function enacted by tacit knowledge and only limited organisations execute the essential methods needed to capture, record and share knowledge. Any Knowledge Management systems program aims to safeguard tacit knowledge from loss and ensure that it stays within the organisation even after the employees leave the organisation for varied reasons, be they personal or professional. Several public organisations fail to comprehend the significant function enacted by headship to develop suitable settings to develop, choose, arrange, save, spread and transfer knowledge to attain the tactical aims of an organisation.

Lee & Choi (2003) state that the absence of a successful leader has an adverse reaction on the efficacy of Knowledge Management as a technique to ensure sustainable development. Hence, before setting up a Knowledge Management department, plan or design, government bodies need to choose able leaders who feel committed and responsibly endorse the practices linked to Knowledge Management either as heads of organisations, as managers of central units for Knowledge Management, as knowledge champions, or knowledge officers. This will ensure that the programs follow an organised, coherent and well set up the framework. Lastly, it is essential to set up techniques that guarantee the "the know-how" of employees is safely stored and stays in the organisation. This may be accomplished by emphasising more on creating and implementing the human face in the Knowledge Management procedures.

2.9. Technology in Knowledge Management Systems

Today, in the era of complex systems and constant change, knowledge-based activities and knowledge-centric activities have become the primary resource of justifiable competitive advantages.

Liao (2003) has suggested that the advent of technology has led to the accuracy and robustness of knowledge management framework. In other words, the improvement of computer algorithms have led to a better computer and have increased the use of these frameworks. For instance, tools such as artificial intelligence, data mining, modelling, and expert systems have all increased the application of knowledge management framework. Impact of technology on the assessment of knowledge has been significant. So much so that special software solutions have been developed

to facilitate effective knowledge management. Some of the solutions that exist include: document management, content management, organisational taxonomy, knowledge discovery, collaborative services, knowledge portals, competence management, customer relationship management, intellectual property management, and e-Learning management systems. Most of these are based on personalisation or codification knowledge management strategy approach.

However, according to Newell et al. (2009) there is a disproportionate reliance on generic tools and methods that are designed to transfer knowledge and information and not much consideration is placed on the social mechanisms that facilitate such knowledge transfer. In addition, the author also stated that in some situations, the focus is erroneously placed on the act of sharing knowledge and not on facilitating the use of knowledge for problem solving. In addition, a complete reliance on technology enabled tools is considered to be inappropriate. One of the reasons is that the major drawback of IT systems is that it can measure only explicit knowledge and does not work well for tacit knowledge (Storey and Barnett, 2000). In addition, the authors also suggested that making tacit knowledge available through the use of computers is difficult due to tacit knowledge being more context-specific and therefore, more personal. In addition, according to Garcia-Perez and Ayres (2010), using IT based solutions leads to ignoring the complexities of the human mind and behaviour. Thus, it can be stated that reliance on technology for the entire knowledge management process is not feasible. Several researchers including Beesley and Cooper (2008), Lang (2001), Zeleny (2002) and McDermott (2000) have concluded that knowledge management cannot be carried out via IT due to additional factors such as organisational and cultural barriers. Instead, relying on IT Solutions for management of knowledge should be limited to moderation and IT can only serve as a catalyst and not a solution (Tsui, 2005). However, that is not to say that IT solution should not be used at all (Mohamed et al., 2006).

Massaro, Dumay, & Garlatti (2015) add that knowledge is a key resource which needs to be managed for continuous improvement of the business in order for it to stay ahead and be successful in a highly competitive global market. Moreover, organisations need to identify and manage their knowledge base to add real value. With the advent of ICT (Information Communication Technology), there have been new challenges and opportunities regarding sharing, combining or disseminating of knowledge.

Technology is an innate part of all Knowledge Management systems and is generally utilised for all different procedures of Knowledge Management. There are different technological solutions available in the market. A significant decision to make therefore is in choosing the appropriate technology.

There are significant advantages offered by technology that are often not known or overlooked in organisations. It is a significant enabler of efficiency and progress. It can assist in linking individuals with data, and people to one another. However, it is not by itself the entirety of the Knowledge Management solution.

Lee & Choi (2003) state that, given the rapid development of digital-connectivity technology, government agencies across the globe utilise ICT applications to enhance productivity, responsibility, improve transparency and assist in reforming the public sector. Enhanced Knowledge Management systems are crucial for governmental agencies at all levels be they national, regional or local as governmental institutions are primarily knowledge-based organisations. Furthermore, Knowledge Management has become one of the initiatives included in the majority of the nations as in the case of e-Government plans.

2.9.1. Significant Issues

Kulkarni and St Louis (2003) state that Knowledge Management is an important concept of an organisation since it seeks to clarify to employees the role of organisational knowledge to the organisation's success. It also provides additional value to the business roles which are closely related to or part of human resource management. Judging by trends that are supportive of knowledge assessment, it can be observed that every organisation in today's economy is dependent on knowledge. The main focus of the organisations is to create, process or globalise knowledge so that it can improve the knowledge base of the employees and create competitive advantages. Employees are required to be empowered with knowledge for which it is important to share the knowledge with the greater group or other individual (Hallouche & Sultan, 2008). At the same time, it is also important to measure the progress of Knowledge Management at an organisational level and its impact on organisational performance.

Knowledge Management is expected to deal with any premeditated group of practices and procedures within an organisation and is to be planned in order to maximise the utilisation of

knowledge. This thereby enhances allocative success in the domain of knowledge generation, spread and utilisation. On the other hand, Grover (2001) claims that government organisations across the globe have to deal with issues as legal, executive, and judicial. Grover (2001) also suggests they must persistently grow into an electronic work setting instead of paperwork-lowering and cost-lowering directives. These organisations are required to deal with increasing work demand that would have to be handled by existing or fewer employees. Lastly, there is also a need for the implementation of electronic communication modes that may be utilised by taxpayers and citizens, minimising burdens on all parties.

Alavi & Leidner (2001) added that there are a whole host of other variations, including arranging beliefs, frameworks, performance measures, association with the end users, and character of the employees, supply chain, knowledge sources, ownership, performance anticipations, and rewards, among others.

Becerra-Fernandez et al. (2003) noted how choices that are made improperly at earlier stages of development have long-lasting impacts. Knowledge deals with various organisational facets, including raw material, work-in-progress, and deliverables in any given department. Robust choices and successful action depend on having the correct knowledge being accessed, processed or applied at the correct time. 'Correct' knowledge may vary for every choice made. Some choices require basic knowledge while others require in-depth analysis and require validation before implementation; some employ implicit expertise while others require a creative perspective, instinct and discernment. Knowledge Management practices are properly placed to improve the quality of decision-making.

Knowledge Management is not a new concept. KM encompasses employing predetermined management modes like performance management tools, human resources and award systems, new information technology and the like via the viewpoint of enhancing knowledge sharing inside a organisation and with the extrinsic world. Bhatt (2001) pointed out that Knowledge Management is not limited to merely automating of procedures but also cultural change.

Knowledge Management is one of the crucial aspects in collaborative organisations, as such collaboration requires appropriate techniques to share information and knowledge from varied sources. In this context, the utilisation of information and communication technologies is especially crucial as it offers skills to merge information across barriers that would otherwise be

present. Additionally, Darroch (2005) states that the function enacted by public managers needs to be altered from

For Knowledge Management to be successful, a change in the conduct and way of thinking by the individuals employed in the organisation needs to take place. For Knowledge Management to be effective, it needs time to execute processes that are suitable. Several Knowledge Management practitioners have spoken about Knowledge Management systems being implemented and how successful systems chiefly revolve around dealing with the change in thinking and conduct of the employees (Du Plessis, 2007). Very often, Knowledge Management plans are unsuccessful since the significance accorded to changes in conduct and ways of thinking is undermined. For example, if those employed in an organisation think that 'knowledge is power', they think that sharing knowledge will result in a big disadvantage for them. In other words, they may assume that knowledge is a zero-sum game when it is in fact not so. Hence, they hesitate to share knowledge. In such cases, Knowledge Management systems will find limited use instead of becoming a modern depository. If staffs believe in such a zero-sum account, even if sharing of knowledge is compulsory, the staff will share irrelevant knowledge or will share knowledge which may not really be useful. It must be noted that in such cases, the staff members are not incorrect; they are behaving in a perfectly logical manner (Lee & Choi, 2003). However, they are operating under faulty assumptions. Hence, the efficacy of a Knowledge Management system relies on whether the personnel are convinced in addition to being motivated to adapt to this new conduct that it would in fact be advantageous to both the organisation and the members themselves.

To conclude, Knowledge Management is usually referred to as a group of novel institutional practices that are comprehensively pertinent to the knowledge economy. Knowledge Management handles an intended group of customs and procedures planned to maximise the utilisation of knowledge. This serves to enhance efficacy in the domain about knowledge generation, spread and utilisation.

2.9.2. Managerial and Social Issues in Knowledge Management

According to Stenmark (2000), knowledge is a highly competitive resource both at an organisational and an individual level. This competition can give rise to negative knowledge sharing experiences, where employees do not want to share knowledge with one another due to

the intense competition that is taking place. This lack of sharing knowledge with one another can also be referred to as knowledge hoarding (Peng, 2013). Knowledge hoarding can be brought about by fear of competition and the fear of losing the competitive edge. In other words, they don't want to lose what makes them special and hence resist sharing knowledge as, from their perspective, they might lose the chance of growth and prosperity in the organisation (Renzl, 2008).

In addition, this sort of fear is so ingrained in an employee that they perceive knowledge sharing as a threat to their position in the organisation (Damodaran & Olphert, 2000). It can be said that this view has amplified in employees as organisations do not promote knowledge sharing nor do they want it when it takes place (Lam and Lambermont-Forn, 2010). When organisations do not actively promote knowledge sharing, it can lead to the discouragement of willing employees due to the lack of allocated time and the knowledge of what needs to be disseminated (Levy et al., 2010). In addition, lack of trust between employees could also be one of the reasons why this fear has amplified (Paroutis and Saleh, 2009).

In order to rectify this and promote knowledge sharing, organisations need to develop reward systems that encourage employees to engage with one another and transfer, as well as share, their knowledge. This is particularly important because as it has been discussed knowledge is primarily driven by people (Yahya and Goh, 2002).

Jeon et al. (2011) have noted some of the ways human resources can develop robot systems based on reciprocity, reputation, or altruism to motivate employees to share knowledge. In addition, the author also states that the human resources sector can develop training and retention policies to facilitate knowledge sharing.

Organisational culture also plays a role in facilitating or hindering knowledge sharing in any organisation. The burden of creating a culture that promotes knowledge sharing is primarily with the organisation’s decision makers. It has been proven in previous studies that knowledge sharing is facilitated in less hierarchical and formalised environments where decentralisation and innovation is promoted (Cheng and Huang, 2007; Tseng, 2010; Suppiah and Sandhu, 2011).

In addition, some researchers have found that knowledge sharing is most prevalent in cultures that support collectivism and not individualism (Moss et al., 2007).

In addition to the culture, the organisation's structure is also crucial in ensuring the success of the KM initiatives. In organisations that have relatively flat organisational structures, and where hierarchical structures don't exist, due to the inherent matrix structure that is developed, knowledge sharing is promoted to a great degree due to open communication in the organisations (Steiger et al., 2014; Claver Cortes et al., 2007). In addition, several studies have examined the primary structure that can facilitate the governance of the KM functions in organisations (Schroeder et al., 2012). In order to facilitate the KM structure for appropriate governance, one approach posits the development of a formal governance structure headed by the Executive Management team who directs the organisation's KM efforts and reports to the higher-ups directly (Kannabiran and Pandyan, 2010). Several other authors have also proposed the development of the hybrid organisational structure which can help by keeping the company's traditional organisational structure and adding to it, thereby creating a more complex structure but one that promotes more knowledge sharing to enable sustainable management of the KM activities (Mahesh and Suresh, 2009). Furthermore, it can be noted that there is a general view that KM is not related to or limited to only certain managers or departments within the organisation; rather it is concerned with all aspects of the organisation's activities and operations that are implemented by several members in a collaborative environment.

Moving on, there are many studies that have provided some insight into the managerial factors that are necessary for the KM to be successful. There are many case studies that provide insight into the social and managerial factors of the organisation and are seen as critical aspects for the success of KM initiatives in an organisation. For instance, Al-Alawi et al (2007) have denoted these factors as being success factors; Damodaran and Olphert (2000) have denoted them as barriers and enablers; Kamhawi (2012) called them organisational facilitators, and Gold et al (2001) have stated them to be organisational capacities. However, only very few researchers have demarcated the various success factors for each separate stage involved in the implementation of KM (Lin, 2011). On the other hand, others have conducted studies which are limited to only specific industries or small businesses, or project-based organisations as well as telecoms, finance and banking organisations, oil and gas, legal organisations, public services and football clubs (Evangelista et al., 2010; Ajmal et al., 2010; Al-Adaileh and Al-Atawi, 2011; Hallin and Marnburg, 2008; Fullwood et al., 2013; Seba and Rowley, 2010; Doloriert and Whitworth, 2011; Dave and Koskela, 2009). However, some authors such as Bishop et al. (2008) Oksanen and Ståhle (2013), Quaddus

and Xu (2005), Anantatmula and Kanungo (2010) have outlined several factors that add to the success of the KM initiatives:

- There needs to be a link to the business strategy
- Organisational knowledge needs to be defined using an established set of criteria
- Participation and support by top management is crucial
- The organisation needs to recognise knowledge sharing and provide incentives
- Creation of the required infrastructure to ensure that the KM initiatives are supported well
- Establishment of a robust culture of teamwork and communication
- Implementation of management of both explicit and implicit knowledge
- Ensuring that the KM initiatives are defined and the beliefs are communicated across the organisation
- Creation of a holistic framework that does not only depend on technology for effective KM.
- Launching an organisational structure and physical setting that promotes collaboration
- Creation of a workforce and team that is trained in and capable of handling the KM initiatives and provide trainings to the other staff
- Development of standard KM policies that are documented and standardised to ensure that there is a clear understanding of, and hence adherence to, procedures and roles.

2.10. Research Gap

The content analysis regarding the papers in the literature review provides a detailed overview of the main issues covered by the research on knowledge management and has enabled the identification of a principal research gap on the topic. From the literature review it is clear that several scholars have established that the knowledge management strategy is linked to organisational performance (Danish, 2012; Jelena, Vesna & Mojca, 2012; Gholami, Asli, Shirkouhi & Noruzy, 2013). In contrast, Becerra-Fernandez and Sabherwal (2001) indicated that some studies contended that knowledge management initiatives at times failed to have a positive impact on the performance of the business and usually did not result into an improvement in the organisational task outcomes. Hence there are inconsistencies in the literature in relation to the conceptual linkages between the two indicators. In the same vein, several other studies have been

conducted on Knowledge Management and its important tools to enhance the performance of companies and the level of productivity of staff.

There has been a considerable amount of KM research that has focused on areas such as HRM, accounting, and project management. Furthermore, financial models which include the IC of the organisation can provide important indications for the overall investment capabilities and benchmarking. However, it is not indicated clearly in past research where the KM problems are found and what can be done to rectify these issues. Furthermore, there are no roadmaps for the implementation of the KM in organisations (Kannan and Aulbur, 2004). In addition, another trend that is found in research is that the correlation between KM and performance of the organisation are embedded in faulty methodology. For instance, the methodologies do not control for or consider other factors that could have led to the increase in performance and solely rely on a singular measure to establish the correlation (Yu et al., 2007).

In addition, the shortfall of the IC models is that they only rely on a small timestamp to gain in-depth organisational knowledge, only taking into consideration static knowledge sharing and flows instead of considering the dynamicity of knowledge flows (Lerro et al., 2012). Finally, the individual knowledge of an employee in the organisation is not considered and only the entire organisation's knowledge is considered (Kannan and Aulbur, 2004). Thus, the focus remains on the organisational knowledge and it is not extended to the performance and appraisal of the individuals who are in essence contributing to the organisational knowledge.

Based on the conducted literature review, two main research gaps are identified. Firstly, there is a gap in the research on knowledge management in public sectors, particularly in relation to their implementation. Secondly, there is a research gap in the implementation of a wide variety of knowledge assessment models in the holistic development of one organisation. This study seeks to address both these research gaps by implementing MinK as one of the previously mentioned models of knowledge assessment to the Public Relations Department in Saudi Aramco as part of the action research. Furthermore, one of the core objectives of this study is to measure and find the location of knowledge stocks which the organisation can use by pinpointing the individual who possesses the knowledge. In other words, the study aims to use action research and apply MinK framework using the process of mapping the terrain and testing the plausibility of the MinK framework in identifying and assessing individual knowledge in the public sector (Ramsey, 2014).

2.11. Conclusion

This chapter critically analysed different approaches applied in knowledge management. Knowledge Management strategies and human capital planning are two key domains on which modern organisations focus to achieve competitiveness in the current economy. High levels of knowledge assessment capabilities are a given requirement to enable identifying knowledge holders in an organisation, as implied by effective knowledge management strategies. Individual knowledge assessment is essential since knowledge is created, held, and transferred by individuals within organisations. As can be seen from the preceding chapter, the MinK framework ensures the assessment of individual knowledge from several perspectives using well-defined measures. The framework also remains adequately flexible to absorb the key measures in accordance with the organisational context. The MinK framework includes a user-friendly interface with a web-based technology offering advanced security features and accuracy in the assessment outcomes. The use of action research has been identified as the ideal approach in applying the MinK framework through the use of action research steps such as mapping the terrain and testing the plausibility (Ramsey, 2014). The following chapter will outline in greater detail the steps taken in this research as embedded in research methods literature.

3. Research methodology and methods

3.1. Introduction

This chapter outlines the research methodology that has been used for data collection, analysis, and presentation. The present study has adopted these methods to be able to answer the primary research question: how can individual knowledge be assessed in the Public Relations Department in Saudi Aramco? This chapter, hence, justifies the choice of the philosophical position and paradigm that have been adopted. The chapter is structured to first outline the research philosophy, then the approach, strategy, choices, time horizons, and finally the data collection and analysis techniques. This approach is in line with the research onion developed by Saunders at el. (2012).

3.2. Epistemological Position and Philosophy

Before elaborating on the philosophy that is adopted by this research, the overall theory surrounding such choice needs to be explored. The basis of the research philosophy can be found in the nature of knowledge and the development of knowledge (Saunders et al., 2012). In other words, research philosophy is the worldview that is undertaken by the study and which directs the researcher towards the choice of the paradigm (Creswell and Creswell, 2018). Finally, Lincoln, Lynham, and Guba (2011) have noted that the research philosophy allows the researcher to make several assumptions about the nature of reality that is being observed.

There are three primary positions: ontology, epistemology and axiology (Saunders et al., 2012). In addition to this, there are four primary research philosophies: positivism, realism, interpretivism and pragmatism. The following table 3.1 outlines what assumptions each of the philosophies make based on the different positions.

Table 3.1: Research Paradigm

Source: Adapted from Saunders et al. (2012)

	Positivism	**Realism**	**Interpretivism**	**Pragmatism**
Ontology – is concerned with the nature of reality	Favours a highly objective approach and is independent of any subjective, social influence. It assumes that all problems are external and must be approach as such.	This assumes that a subjective approach can be applied to understand an objective phenomenon. It assumes that the objective being studied lies outside of human thoughts, beliefs, and knowledge, but that it needs to be measured in a subjective manner.	This view assumes that reality is embedded in social experiences and that it is possible for more than one reality to coexist within the same frame.	This assumes an external perspective but allows the combination of several views that are best suited to achieve the research objective.
Epistemology – is concerned with the researcher's view of acceptable knowledge	This assumes that there is only one way to measure the observable event: by collection of hard data and facts. This is also concerned with establishing a causal relationship between two or more variables.	This is further categorised into direct realism and critical realism. Direct realism assumes that what is observed must be the truth and if it is not, then the perception is wrong. On the other hand, critical realism assumes that	This assumes that based on the various perspectives, the meaning of the event will change. This also assumes that a subjective interpretation is necessary.	This allows the combination of observable phenomena being fixed in reality along with the changing reality based on the perceptions. Furthermore, this allows the researcher to adopt multiple data methods to ensure that the research question is answered.
Axiology – is concerned with	This assumes that the values	This assumes that the	This assumes that the	This assumes that the personal

the role of the researcher in the research inquiry	and beliefs of the researcher need to be eliminated to generate a truly objective view.	researcher brings a set of biases due to their own personal values and that these biases will affect the research.	researcher is bound by their personal values and as such cannot be separated from the research.	values of the researcher are crucial and that they can adopt both subjective and objective views.
Data Collection methods to be adopted	To be done using large samples, highly structured, quantitative data.	Methods that are chosen need to fit within the research's objectives. Primarily quantitative.	Methods used revolve around in-depth investigations that are qualitative in nature	Methods can be drawn from multiple sources and can be both qualitative and quantitative in nature.

The above table has outlined the multiple paradigms and philosophies that are available for the researcher to choose from guided by the research objectives. In light of the above, the research philosophy that is chosen by this research is pragmatism as embedded in epistemology. The primary aspect of pragmatism is that it is used to solve real world problems (Easterby-Smith et al., 2015). In other words, Tashakkori and Teddlie (2010) have classified this philosophy as one that uses pluralistic approaches to build an understanding into the research problem.

Morgan (2014) has outlined that pragmatism allows "using a belief in practice, in which knowing cannot be separated from doing ... [where] the knower and the known are inseparable, bound together in a process of inquiry" (p. 4). Furthermore, Dewey (2008) has outlined that pragmatism includes inquiry and reflection as they are accompanied by actions and beliefs which then serve as the basis for research. In other words, Dewey (2008) has stated that the first step is the recognition of a problem, the second step is the reflection, and the third step is the development of a solution for the identified problem. In line with this, and due to the research objectives of this study being to learn about the current knowledge management practices in the Public Relations Department within Saudi Aramco, and then testing the introduction of a knowledge assessment framework for effective knowledge management, the ideal approach is pragmatism. Furthermore, based on the objectives of the study, the study cannot rely on a single scientific method for the social enquiry and hence, the use of pragmatism is justified. Finally, using a mono-method approach will hinder the researcher from answering one of the research questions.

In simpler terms, the first step is to recognise a problem which is being done in this study by the analysis of the current knowledge management practices in the Public Relations Department of Saudi Aramco. The second and third step of pragmatism are being carried out in the second research objective of this study where the study will recommend a framework for better knowledge management and test its applicability.

3.3. Research Approach

There are two primary research approaches: inductive and deductive (Creswell, 2013). The general trend is to choose one research approach over the other as determined by the research objective (Saunders et al., 2012). However, this research is considering the research as a cognitive process as outlined by Bailyn (1977). In other words, Bailyn (1977) outlined that the research process is iterative and one cannot find the solution to something without knowing what it is they want to solve and without the ability to perceive the relative importance of a finding in the context of the study. In other words, the research process is both deductive and inductive in nature where researchers are consistently testing hypotheses (deductive) and generating new information (inductive). Rather than selecting either inductive or deductive approaches independently, this research is following the approach that was adopted by Dougherty et al. (2000) by adopting deduction and induction in conjunction to one another. This choice has been made due to the fact that this research is first trying to understand the current scenario of knowledge management in Saudi Aramco's Public Relations Department (inductive) to the testing of the applicability of the new knowledge management framework (deductive).

In this context, an inductive approach has been identified by Braun and Clark (2006) as an approach that characterises a strong association between the data and the themes developed. Inductive analysis is the process of coding the data in line with the established themes with little to no influence of the researcher's preconceptions or research interests (Braun and Clark, 2006). On the other hand, the deductive approach is highly analysis-driven which means that the analysis is based on some aspects of the data and it is highly influenced by the researcher's research interest (Braun and Clark, 2006).

3.4. Research Strategy - Action research

As outlined by Saunders et al. (2012), there are several strategies that can be used to meet the research objectives: experiment, survey, case study, action research, grounded theory, ethnography, and archival research. The steps that have been described in the preceding sections with regards to the philosophy of the current study (pragmatism), are closely in line with the steps that are taken in action research. Action research is not embedded in a singular methodology, but rather is carried out in a pluralistic manner (Greenwood, 2007). In this research, the strategy that is being adopted by the researcher in order to meet the research objectives is pragmatic action research. Pragmatic action research is characterized by the fact that it does not need to outline a priori outcomes of the research (Coghlan and Brydon-Miller, 2014). The use of pragmatic action research has come from the need to solve a complex and multidimensional problem of effective knowledge management and identification of knowledge stock in the Public Relations Department of Saudi Aramco.

3.4.1. Introduction to action research

Action research is considered to have been developed by Kurt Lewin when he was attempting to solve the social issues that existed in some American communities in the late 1940s (Coughlan and Coghlan, 2002; Kemmis et al., 2014; Bargal, 2006). While the method was developed for solving social issues and wider educational problems, it has expanded to organisational learning and development (Thorpe and Holt, 2008). Coughlan and Coghlan (2002), in their seminal work regarding action research, have classified it as being research that is embedded in action and which is participative; usually involving a series of events that are aimed at problem solving and are synchronous with action (p. 222). In terms of applicability in organisational development, action research creates a bridge between theory and practice as well as generates new knowledge which the organisation can then use to develop its internal capabilities (Coghlan and Shani, 2013; Coughlan and Coghlan, 2002).

Following this, the application of action research can be seen in several areas and disciplines (Thorpe and Holt, 2008). All variations of action research, whether they be pragmatic action research, emancipatory action research, action learning, science, or contextual, among others (Greenwood and Levin, 2007), have some common elements. For instance, the first element of

any action research is that the researcher is a part of the research problem or organisation that is being studied (Coughlan and Coughlan, 2007). The second element is that all action research is cyclical and revolves around identification of a problem, its analysis, and development of a plan of action, taking the action, and then evaluating the action (Saunders et al., 2009). The cyclical process of action research allows the researcher to adopt a solution and evaluate its effectiveness as well as make a change to the initial solution based on any inefficiencies that have come to light (Saunders et al., 2009).

3.4.2. Action research cycles

According to Coughlan and Coghlan (2002), there are two primary action research cycles that revolve around six steps that include: data gathering, data feedback, analysis, action planning, implementation, evaluation, and a meta-step of monitoring. This has been depicted in the following figure.

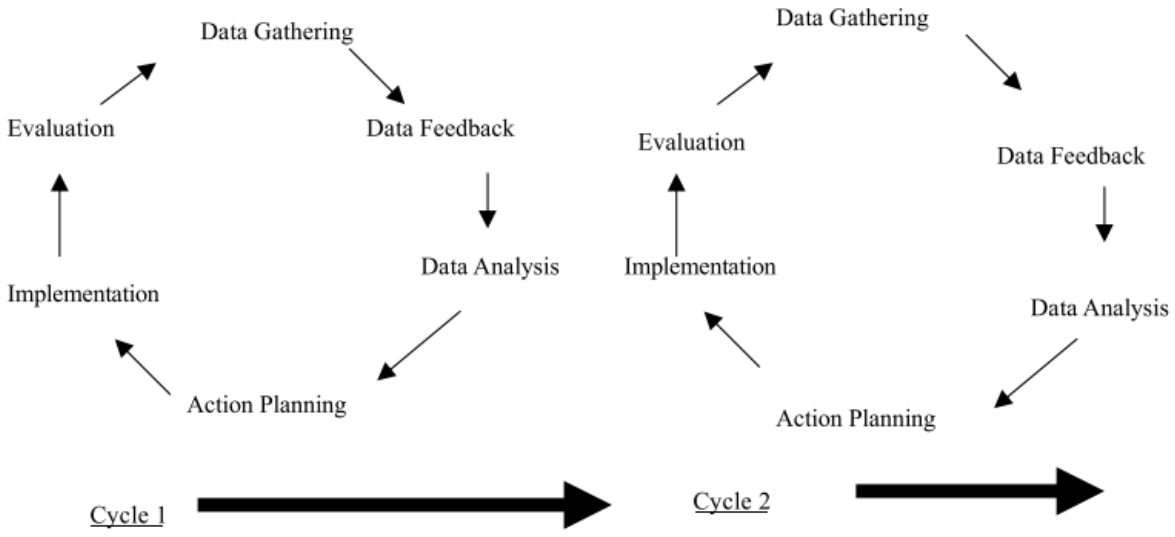

Figure 3.1: Action Research Cycles by Coughlan and Coghlan (2002)

On the other hand, Saunders et al. (2009) have outlined the action research process in the form of an action research spiral which is depicted in the following diagram.

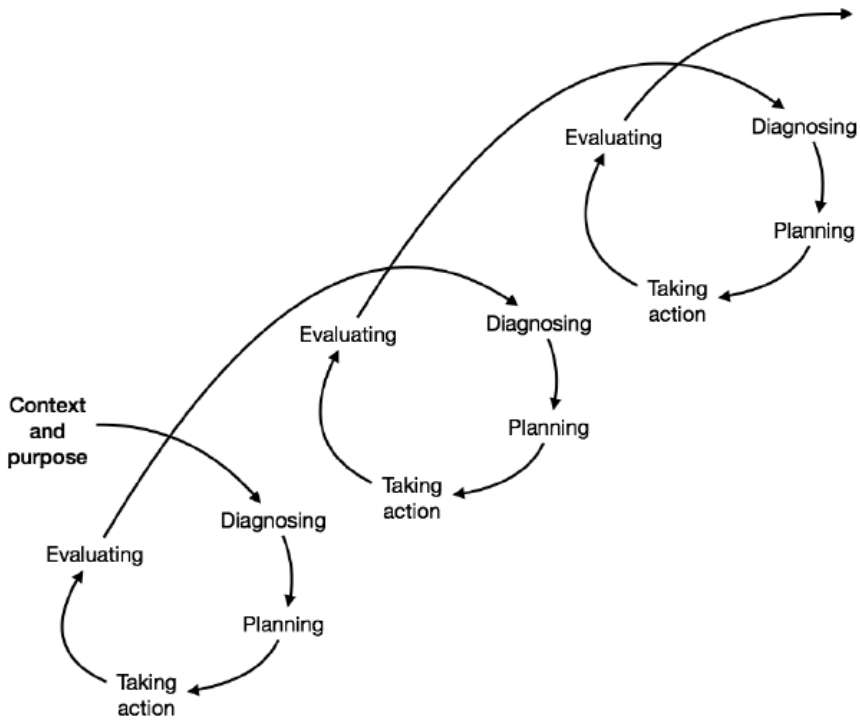

Figure 3.2: Action Research Cycles by Coghlan and Brannick (2005) and Saunders et al. (2009)

While the above two figures depict similarity in the process of action research as outlined by Coghlan and Brannick (2005), Saunders et al. (2009) and Coughlan and Coghlan (2009), Saunders et al. (2009) have added a pre-step to the cycle which involves establishing the context of the research and the purpose. In addition, one of the core characteristics of the action research spiral developed by Saunders et al. (2009) is that there is no clear indication of when the problem will be solved, which is the case for an organisational problem.

In this research, in line with the action research spiral, two broad steps are being considered: mapping the terrain (which will involve setting the context and purpose, and the diagnosis) and testing the plausibility (of the solution; which will involve planning, taking action, and evaluating). In effect, one spiral from the action research spiral is divided into two research cycles for the purposes of this research.

3.4.3. Quantitative and qualitative methods as part of action research

Quantitative research, according to Tashakkori & Teddlie (2010), primarily aims to measure the variables under the study and assess their dependency on each other. Quantitative research can help in testing hypotheses by using statistical analysis. It can be directed to a large population and thoroughly researched areas (Tashakkori and Teddlie 2010). On the contrary, qualitative research gathers details of different contexts, situations, people and their inter-personal interactions including behavioural dimensions. Easterby-Smith et al. (2015) commented that these qualitative data capture the nuances of human experience, attitudes, belief systems, prejudices, values, thoughts and feelings. Qualitative studies are based in interpretive philosophies and look for an in-depth understanding that often leads to development of new theories.

In line with pragmatic action research, this research is adopting a qualitative approach as its primary research method and supplementing it with quantitative data. Qualitative data, in addition to data obtained from operationalising the MinK framework, will be used for mapping the terrain and qualitative data will be used for testing the plausibility. In other words, this research will use semi-structured interviews as a means of understanding what the current scenario is in the Public Relations Department of Saudi Aramco and operationalising the MinK Framework (mapping the terrain) as the ideal knowledge management system in the said department, and identifying the feasibility and legitimacy of applying the MinK framework throughout the organisation (testing the plausibility).

3.4.4. Research conducted by insiders

One of the core differences between action research and traditional research is that the former is carried out with the aim of improving upon one's practice and, as such, has wider practical implications than traditional research which is embedded in a more theoretical sphere. In this context, it is important to consider the six positionalities that an action researcher can take as outlined by Herr and Anderson (2014). These six positionalities are: insider research based on self's practices or organisational practices, insider research in conjunction with other insiders, insider research in conjunction with outside researcher, outside researcher in collaboration with insider, and outsider studying insider (Herr and Anderson, 2014). Since this research is based in Saudi Aramco's Public Relations Department, the first positionality is being applied due to the

researcher being a part of the Public Relations Department in Saudi Aramco. In effect, the researcher is deeply familiar with the issues that surround knowledge management in Saudi Aramco's Public Relations Department. By applying the first positionality, the researcher is contributing to an improved knowledge management strategy in the department and transformation of the entire organisation with the application of the new knowledge management framework.

3.5. Data Collection Technique and Analysis Procedure

As has been outlined in the preceding sections, this action research is characterised by two action research cycles: mapping the terrain and testing the plausibility. However, before the beginning of the research cycle, the research has attempted to establish the context and purpose of this research based on the action research spiral by Saunders et al. (2009).

3.5.1. Initial problem identification

The initial problem that has been identified by the researcher (as an insider) is that while there exists a vast amount of tacit and explicit knowledge in Saudi Aramco's Public Relations Department, the same is not readily available to daily operations. Furthermore, in addition to not being readily available, it is not clear where the knowledge stock is located. Despite the argument that the knowledge stock is located within the information systems of the organization (Newell, 2009), insider information stipulates that there is no such information system currently implemented in the organisation. Furthermore, there is also a possibility that the knowledge is found in the social networks and organisational best practices (Newell, 2009), which is under exploration in the current study.

The researcher recognises that Saudi Aramco is a public sector organisation and as such is not driven by the same concerns of profitability which drive the private sector. This focus on profitability by the private sector is one of the reasons why the knowledge management process is highly incentivised in the private sector. On the other hand, there is typically a lag in the acceptance and implementation of such practices in public sector organisations as they are incentivised differently. The main reason for developing the study is to identify the importance or the need for knowledge management in a public organisation—while researching the Public Relations

Department in Saudi Aramco, in particular. It has focused on how knowledge management has helped in sharing knowledge through individuals in a public company such as Saudi Aramco.

3.5.2. Literature review and initial reflection

Once the initial problem had been identified, it was important to see if the resolution of the problem has wider implications for the knowledge management body of research as a whole and for the general organisation (Saudi Aramco). For analysing this, a robust literature review has been carried out to identify the current theoretical problems that may exist in scholarly research. It has been identified that not only will this research generate new knowledge for effective knowledge management in organisational settings, but that it will also ensure that the knowledge management and knowledge stock identification is enhanced across all departments of Saudi Aramco.

3.5.3. Qualitative research method applied in action research cycle one (mapping the terrain)

As outlined previously, the data collection process that has been applied in this research for understanding and analysing what the current scenario is in Saudi Aramco's Public Relations Department with regards to its knowledge management process, is qualitative semi-structured interviews. Interview method, as stated by Saunders et al. (2009), is particularly useful when the researcher attempts to collect vast amount of qualitative data. Since the present research is based on the respondents' opinions and narratives that are qualitative in nature the method of interviewing would be more useful.

Along with various other advantages, Kvale (2008) noted that it is through this process of in-depth interview the researcher can gain insight in the lives of the interviewees. The author also pointed to the power imbalance that exists between the researcher and the respondents. It often assigns a feeble role to the interviewee who is regarded as the only informant of the phenomena. Thus, a researcher has to be keen at his approach and maintain a distance so that his presence does not in any way affect the responses of the participants. While collecting information, it is also important that the researcher encourage the respondents to provide extra information. Thus, interviews are not simply a method that has certain fixed rules. A lot depends on the researcher's experience and expertise to draw out the most pertinent information from the subjects. Furthermore, the researcher

conducted semi-structured interviews which is the ideal approach due to the fact that it is allows the researcher to engage in a natural dialogue with the participants while maintaining control over the direction of the interview (Silverman, 2013). In addition, adopting this approach allowed the researcher to ask follow-up questions during the interview when the need arose.

As per Gioia et al. (2012), there are three main features of the data collection process: i) The respondents are treated as the most knowledgeable being on the subject (This contradicts Kvale's view of the interviewer as the superior); (ii) The interview guide must provide for some flexibility during the interview process; (iii) The previous interviewees must be interviewed again in the light of the new sets of information received by the researcher.

In the light of the above discussion, interview is regarded as the most suitable technique to gather the required information. As stated, the flexible, semi-structured interview method provides the respondents a chance to provide additional information, while the researcher can also seek clarification. This sort of design of the interview guide can escape the limitation that a typical questionnaire has. While this enhances the researchers' involvement in the research, Gioia et al. (2012) stated that the response rate in this method is also high and the respondents are more spontaneous. In-depth interviews conducted through this method helps in both ways and build a relationship between the interviewer and interviewee. The indirect questions in the interview schedule help the researcher to gain an idea about the respondents' inner feelings and motives on the KM activities and MinK framework in Saudi Aramco. Kvale (2008) additionally suggests a debriefing session before and after the interview.

The interview guide consisted of the following questions as presented in the below table.

Table 3.2: Interview guide questions

Questions	Justification
1. Do you consider general knowledge management to be important in your organization? 2. What about individual knowledge management?	The above two questions allow the researcher to understand the perception of the organization with respect to general and individual knowledge management.

3. Is there a particular framework that is being used in Aramco for individual knowledge management that you are aware of?	The aim of this question is to identify if there is any existing system for knowledge management. This will allow the researcher to outline the current strategies that the organization is using.
4. Do you/Does your manager carry out a 360 degree feedback and performance appraisal during the annual evaluation?	This question is aimed at the identification of the use of a sophisticated performance appraisal method in the organization. This will allow the researcher to map out the current performance appraisal landscape in the organization.
5. What do you think about the current knowledge transfer process in Aramco?	This question will allow the researcher to map out the current knowledge transfer process and outline its efficiency in the organisation.
6. Do you think the organisational culture facilitates it or hinders it?	This question is aimed at identifying the role that the beliefs and attitudes that the organisation has and how it influences the knowledge transfer process.
7. Do you think there is a need to add a reward system and compensation as parameters to evaluate knowledge sharing?	This question is aimed at uncovering the beliefs of if adding a compensation or incentive will enhance the process of knowledge sharing.
8. Have you heard of the MinK framework? Do you think you could see the MinK framework being implemented in the organisation?	This is aimed at outlining the possible implementation of the MinK framework in the organisation.

3.5.4. Sampling for interviews

In this context of this part of the action research cycle, the sampling technique that is employed is known as purposive sampling (Patton, 1990). This sort of non-probability sampling method is employed as certain criteria have already been identified for selection of the sub-set population. The rationale behind choosing this sort of sampling method is that it allows selection of the most knowledgeable professionals that adequately meet the purpose of the given research. Thus, the information was obtained from the managers and their subordinates who have been mostly involved in the system. The selection of such a sample helps the researchers to escape the limitation of choosing a small sample size. This, in turn, also increases the credibility of the research findings as the information that has been analysed was derived from authentic sources.

Through the purposive sampling method, a total of 26 employees: managers, division-heads, supervisors, and subordinates were selected for collection of data. The same is depicted in the below table.

Table 3.3: Participant Profile and Duration of Interview

Participant	Position	Duration of the Interview
Participant 1	Manager	36 minutes
Participant 2	Manager	30 minutes
Participant 3	Manager	45 minutes
Participant 4	Division-head	38 minutes
Participant 5	Division-head	43 minutes
Participant 6	Division-head	40 minutes
Participant 7	Division-head	30 minutes
Participant 8	Subordinates	29 minutes
Participant 9	Subordinates	39 minutes
Participant 10	Subordinates	34 minutes
Participant 11	Subordinates	32 minutes
Participant 12	Subordinates	38 minutes
Participant 13	Subordinates	41 minutes
Participant 14	Subordinates	43 minutes
Participant 15	Subordinates	50 minutes
Participant 16	Subordinates	35 minutes
Participant 17	Subordinates	36 minutes
Participant 18	Subordinates	42 minutes
Participant 19	Subordinates	43 minutes
Participant 20	Subordinates	43 minutes
Participant 21	Subordinates	44 minutes

Participant 22	Subordinates	42 minutes
Participant 23	Subordinates	36 minutes
Participant 24	Subordinates	33 minutes
Participant 25	Subordinates	38 minutes
Participant 26	Subordinates	44 minutes

3.5.5. Data Analysis of the qualitative data

Silverman (2013) stated that, while conducting research, it is important for any researcher to keep in mind the below points.

- A researcher should focus on 'What' of the objective rather than asking questions like 'Why'. Along with this he should also focus on the way things are said and try to understand their value propositions.
- A time-frame should be considered while gathering data to capture the chronological development of the occurrences and the changes that have taken place.
- Contextualisation is another important aspect of any research. Different views of the same aspect can exist in different organisational settings.
- A comparative analysis should be conducted by the researcher. If an external set of data is not available, then internal comparison between the response sets should be done for better understanding.
- The researcher should also keep the wider context in mind in spite of the narrowness of its application.
- Lateral thinking must be done to uncover hidden theoretical models within the data set. Any incongruity in the data should always be identified.

Gioia et al. (2012), on the other hand, provided a scientific three-step data analysis process. At first, the data needs to be coded while maintaining its integrity. The next step is to transform it into conceptual or theory-centric data. Thereafter, the conceptualised structure, the theme and other dimensions are converted into a data structure for analysis.

On the contrary, Ollerenshaw and Creswell (2002) provided a simple five-step analysis process that starts with recording and transcription of the data. The second step involves thorough reading so that a pattern can be determined from it. The third stage is colour coding and grouping the similar patterns together by using the software NVIVO or Nudist. The fourth step is organising the colour codes and the last one entails sequencing them in a proper way.

In accordance with the above discussion, the data analysis in this study is done in a thematic fashion. At first the data is collected, recorded and transcribed. These transcriptions are contextualised based on the respondents' organisational settings. Thereby, coding is conducted to draw out the underlying pattern. Key themes are identified by employing narrative analysis. After this, a comparative analysis is also done between the different contextualised data sets to arrive at a possible explanation of the social phenomena. Thereafter, all categories are taken into consideration and examined by using comprehensive narrative analysis in order to identify the generalised theme that entails all the participants. These generalised propositions are then substantiated with the secondary source material outlined in the second chapter.

On an operational level, the data was read carefully to allow the researcher to identify texts that were meaningful to the research questions and the aim. The second step involved the categorisation of similar groups of data together to form groups which aided in the development of analytic categories. The third step involved the review of these categories to ensure that the name which defined these categories was appropriate and that the data that made up these categories was exhaustive. Based on this thematic analysis, five a priori themes and three emergent themes were identified.

3.5.6. Quantitative research method applied in action research cycle one (Mapping the Terrain)

Having identified the problem that exists in the Public Relations Department of Saudi Aramco, the next stage of the action research cycle was to operationalise the application of the MinK Framework. For this purpose, a survey questionnaire was developed by using the indicators of the MinK framework and was circulated to the respondents who participated in the qualitative semi-structured interviews.

3.5.7. Sampling for quantitative data

The same process of purposive sampling was used as was used in the qualitative inquiry. The sample size, however, was 26 people multiplied by a factor of four as the MinK framework is a 360^0 assessment tool. Therefore, the total sample size for testing the plausibility of the application of the MinK framework for knowledge management and identification of knowledge stock was equivalent to 104. This sample size of 104 was obtained by analysing the 26 participants 4 times (26 times 4) as it is a 360 degree assessment which evaluates one individual from the perspective of themselves, their manager, their peers, and their subordinates (Ghorpade, 2000). Thus, each employee generates four data records (Ghorpade, 2000).

3.5.8. Data Collection Process for quantitative data

The data was collected using the survey method. The questionnaire was administered to the participants online via email. An estimated time for survey completion was mentioned for the respondents and the link was active for 30 days to solicit the maximum number of responses.

3.5.9. Data Analysis for quantitative data

The analysis of the results obtained through the MinK framework are analysed using the formulae and procedures set out by Ragab and Arisha (2014). The results obtained from the calculation elaborated above gives two variables as output. The first one is IKS or Individual Knowledge Score that corresponds to the score of individual knowledge attributes that is measured on a scale ranging from 1 to 7. *Willingness Coefficient* (WLcof) is the second variable that measures the attitude towards knowledge sharing and is presented in the form of percentage. Thereby, the ultimate IK-Index that is then calculated is the mathematical output of both the above-mentioned variables. Thus, as an example, if two individual X and Y have the same score in the first variable, i.e.; IKS, but the former scores higher in the second variable WLcof than Y, then X would receive a higher IK-Index.

Thus, by putting together the variables that are presented in the equations 1 to 12, the final formula that is computed of IK-Index, formulated by the MinK framework is as below.

$$\text{IK Index} = \left(\sum_{c}^{C} \left(\sum_{a}^{A} \left(\sum_{m_c}^{|m_c|} R_{m_c a} \cdot w_{m_c} \right) w_a \right) w_c \right) \cdot WL_{cof}$$

Taken as a whole, the IK-Index is computed by applying three aggregation procedures. The first one simply sums up the outputs of different parameters combining them under each of the constructs to arrive at an overall rating on the individual construct, per appraiser. Another MCDA technique is used for summation of the ratings of the metrics under the individual construct. This is the Weight Sum Model (WSM) method. This method provides a proportional linear conversion of the figures, so that the ratings' comparative order of magnitude stays intact and equal. The weighted average of each construct is calculated by multiplying metric's weight and the rating of the individual appraiser. Thereafter the products of all metrics are added up.

The second aggregation mentioned previously, sums up the ratings given by each of the appraisers for each construct. The weighted average of every single appraiser is computed by each of the constructs. This is done by multiplication of the two variables; that is, the appraiser's weight and the construct rating by the appraiser. Thereafter, the products of all the appraisers are added up. However, there is an ongoing debate regarding what should be the best possible weights of various appraisers in 360-degree feedback system and hence they are not predefined by the MinK model. Hence, it is suggested that the organisation is involved in the process of assigning the weight of the appraisers.

The third or the final aggregation process merges results of all the constructs in order to generate an overall Individual Knowledge Score (IKS). Once more, by the application of the Weight Sum Model (WSM) method a weighted mean of all the constructs is attained in order to calculate the Individual Knowledge Score (IKS) by each of the individual. From the previous step the aggregated ratings for the constructs are taken are then multiplied by weight of the constructs that is derived from AHP (wc) and then summed for all the constructs.

3.5.10. Qualitative research method applied in action research cycle two (Testing the Plausibility)

Upon completion of phase one of the action research cycle, the researcher analysed the results obtained from the operationalisation of the MinK framework and presented the same to the

executive management team. A focus group was carried out to ensure organisation-wide agreement on the application and usage of the MinK framework. Focus groups are considered to be a form of group discussions (Saunders et al., 2009) that are conducted with a clearly defined schedule and direction and are moderated by the researcher (Carson et al. 2001).

In addition, to ensure that the project of implementation of MinK was seen as feasible and legitimate in light of the operational results of the framework, a focus group was thought to be appropriate. Moreover, in the case of non-agreement for the use of MinK, the reasons could be debated upon which would then reveal the true scale of feasibility of applying MinK in Saudi Aramco for knowledge management and knowledge pinpointing. Furthermore, focus groups can help in decision-making as well as aid in the development of service or programs (Krueger and Casey, 2015).

3.5.11. Sampling for focus group

The sampling process for the focus group was that of purposive sampling described by Patton (1990). This approach was also adopted in the qualitative phase of the research cycle one of this research. Using this, the sampling method identified that the most appropriate sample for conducting a focus group would be the senior managers of the executive management team at Saudi Aramco. They were chosen because of their decision-making capability, their involvement in the budgeting process, their keen understanding of the hierarchical structure of the organisation, and their influence across the organisation. Furthermore, the executive management team were the best people to judge the long-term benefits of applying the MinK framework in the organisation.

In terms of the sample size, Krueger and Casey (2015) have suggested that using five to eight participants for the focus group in non-commercial settings will yield insightful information. In addition, Krueger and Casey (2015) cautioned against using a larger sample because the focus group will become difficult to manage. In addition, the authors also noted that a mini-focus group can also be carried out with four to six participants but that this is not sufficient for an in-depth discussion due to the limitation on the extent of varied information that can be generated.

In line with the above, the sample size of eight participants was established for conducting one focus group. This focus group was a multi-category focus group in that it consisted of participants

who were of a different type from one another (Krueger and Casey, 2015) which then allowed the researcher to obtain detailed insights from one focus group and did not have to conduct multiple focus groups.

For the data analysis, the approach adopted is similar to that of the analysis conducted in phase one of the action research cycle one. In other words, the analysis was carried out using a template analysis which is a thematic analysis approach based on the steps outlined by Braun and Clarke (2006).

3.6. Trustworthiness in Qualitative Research

Qualitative research is often said to be lacking in trustworthiness due to the limitations in appropriately addressing the concepts of reliability and validity that are present in quantitative research (Shenton, 2004). To ensure that there is sufficient distance from the positivist approach, Lincoln and Guba (1985) outlined that there is a need to evaluate the trustworthiness of qualitative research based on the criteria of credibility, dependability, confirmability, and transferability.

Furthermore, trustworthiness was established using the following steps:

- Establishing credibility for the qualitative inquiry: for this member checking (Creswell and Miller, 2000) was carried out where the researcher provided transcripts to the participants to evaluate if the information contained within was an accurate representation of the interview itself. In addition, the analysis of the results were also verified to ensure credibility of the analysis by academic peers who were requested to review the process of the research and provide their feedback.
- Dependability: This was ensured by outlining the research process clearly, logically and ensuring that there was transparency in the data along with a clear documentation of the research process. To ensure transparency, the sample coding table is provided in Appendix A. In addition, an audit trail was maintained (Connelly, 2016).
- Confirmability: To ensure that the findings are consistent and that they could be replicated, an audit trail was maintained and detailed discussions were carried out with academic peers and senior colleagues (Connelly, 2016). Furthermore, the researcher also relied on the

feedback of the subject-matter expert under whose guidance the research was being carried out.

- Transferability: The transferability of this research is ensured in that other large scale organisations can learn from this research regarding the implementation of the MinK framework knowing that it was tested in Saudi Aramco. More specifically, the findings of this study can allow other organisations to gain better insight into implementing knowledge management systems on the basis of their requirements.

3.6.1. Validity

Validity and reliability are the most important two considerations in any research project. Validity of the research refers to the effectiveness of the various measures employed at different stage and aspects for enriching the investigation that are expressed in the research aim and objectives (Yin, 2014). In this conjunction Kvale (2008) stated that data integrity points towards the validity of the research. Saunders et al. (2009), on the other hand, stated that validity assesses whether the researcher is on track and is measuring what s/he intends to. In case of grounded theory, validity is assessed at every step that renders it to be innately valid. However, the issue of validity in social studies research is centred primarily in cases of qualitative study whereby the researcher is required to demonstrate the credibility of the method.

Triangulation, disconfirming evidence, member checking, researcher reflexivity, and prolonged engagement in the field, collaboration and the audit trail are the proposed methods by Creswell and Miller (2000) that can be used to assess the validity of the research method. The below figure summarises each of the above-mentioned method.

Paradigm assumption/Lens	Postpositivist or Systematic Paradigm	Constructivist Paradigm	Critical Paradigm
Lens of the Researcher	Triangulation	Disconfirming evidence	Researcher reflexivity
Lens of Study Participants	Member checking	Prolonged engagement in the field	Collaboration
Lens of People External to the Study (Reviewers, Readers)	The audit trail	Thick, rich description	Peer debriefing

Figure 3.3: Validity Procedures and paradigm assumption

(Source: Creswell & Miller, 2000)

Going by the above discussion, it has been identified that an audit trail is the most useful method for this particular study. As has been described above, in this method the lens shifts from the researcher to the experts that are located externally. This can be conducted by taking input from the HR contacts of the organisation who hold long discussions with the participants and analyse the narrative content. During such discussions the researcher will record and document everything for future reference and cross-checking. In such cases the external experts act as an external auditor who then studies the research findings and provides comments on the same.

This process helps in scrupulous inspection and fact-checking that adds the highest credibility to the research.

3.6.2. Reliability

Silverman (2013) stated that reliability points to the consistency that is depicted in the process of data interpretation. The author suggested low-inference descriptions for maintaining reliability. Here the data that is recorded during the interview is transcribed word-for-word in order to avoid any kind of bias.

Easterby-Smith et al. (2015) proposed asking three simple questions that would pinpoint the reliability of the data. (i) Will the data give the same findings when measured on diversified occasions? (ii) Will the other researchers arrive at same result? (iii) Is the raw data that is collected is transparent enough for sense-making?

Thus, in this research verbatim transcription is conducted so that biases can be avoided and the researcher's interpretations do not affect the research findings. Furthermore, the researcher personally interviewed the respondents so that the standard and quality of the data can be maintained.

3.7. Ethical issues

Ethical dilemmas are very important in academic projects and several measures are taken to avoid such issues. All the respondents were briefed regarding the purpose of the study which is purely

academic in nature. Their responses were kept confidential and anonymity was maintained during the data collection process. Along with these, the transcribed copy of the responses is offered to the informants for reviewing to avoid any kind of misinterpretation.

Consent forms were duly filled in by all the participants for adherence to rules and regulations of the study. All the respondents were treated equally and offered full confidentiality, privacy and anonymity. The information collected is stored in computer hard drive that is protected by password to prohibit any unauthorised access.

4. Findings, Analysis and Discussion of the Qualitative Findings

4.1. Introduction

This chapter provides results of the action research cycle one which consisted of the qualitative interviews and the operationalising of the MinK framework. The purpose of the interview was to uncover the current practices and attitudes relating to KM in the organisation and identify if the participants want to see the application of the MinK Framework to facilitate KM in the organisation. Operationalising the MinK framework was to ensure that the framework could be operationalised.

This chapter is divided into two primary sections: Phase One and Phase Two. Phase One outlines the results of the interviews that were carried out. The analysis was carried out using template analysis and is presented based on the codes that were generated from the data. First-order codes are presented as subsection headings starting from sub-section 4.2.1 through 4.2.4. Second-order codes are presented within these sub-sections. These codes are presented with the aid of direct quotations from the participants, analysed, and subsequently discussed against prior literature.

In the second section of this chapter, the results of the MinK framework are presented. These results are also analysed and discussed in relation to extant literature.

4.2. Mapping the Terrain – Phase one

It is important to consider the attitudes of the employees in the organization with respect to KM due to the fact that if the personnel are convinced that the KM will be advantageous to their organization, then they will be motivated and accept the KM framework (Du Plessis, 2007; Lee & Choi, 2003).

Thematic analysis (Braun and Clarke, 2006) was used for the analysis and involved the generation of several a priori and emergent themes that were used for the analysis. For issues of reliability, many of the participants' responses have been provided verbatim and discussed on the basis of prior research (transcripts are attached in Appendix C). The following subsections outline the findings of the research in great detail.

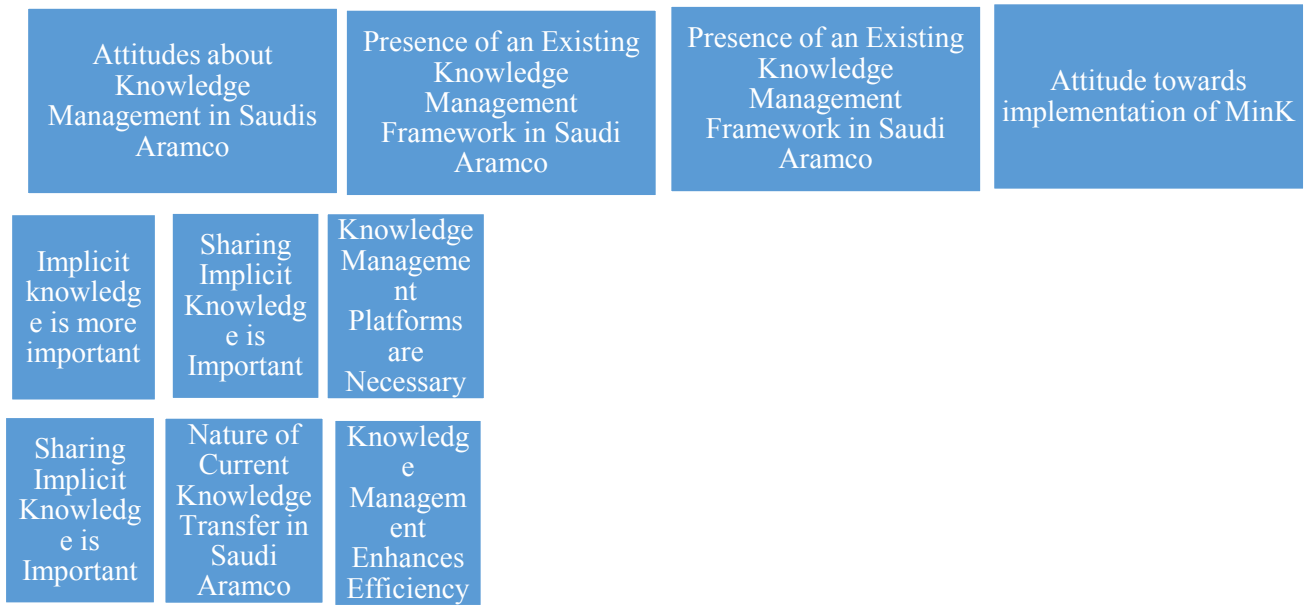

Figure 4.1: Coding Summary

4.2.1. Attitudes about Knowledge Management in Saudi Aramco

The first-order code that was generated based on the thematic, template analysis is the attitudes the employees in Saudi Aramco have with regards to the importance of knowledge management and the need for a knowledge management platform. Several second-order codes were generated within this first-order code: implicit knowledge is more important; sharing of this implicit knowledge is crucial; knowledge management enhances efficiency, and knowledge management platforms are necessary. Each of these second-order codes are presented below.

Implicit knowledge is more important

One of the crucial findings of this study is that participants perceived implicit knowledge to be more important than explicit knowledge. To put this in perspective, Participant 1 noted, "For our company what's really important is that people that develop knowledge about how our company works is immensely important. And our projects that you work on the more experience that you get in navigating, you know how to get things done in the most efficient way you establish contacts, you understand cultural differences in most organisations, learning how to go between those and

how to get your work done. And so that's a level of institutional knowledge that people gain while they here and I think when they leave here so I think that you can encapsulate that somehow, to somebody so they didn't have to go through the trial and error so that would speed up efficiency." Based on this insight provided by Participant 1, it can be noted that they perceive the institutional knowledge and the implicit knowledge to be a crucial aspect of the work they do. Knowledge of the processes and procedures that are carried out in the research are crucial as it can allow employees to navigate hierarchical structures while ensuring that they are completing the requisite work without causing conflicts when interacting with diverse employees. Being implicit in nature, such knowledge is emphasised in the organisation as it cannot be taught and has to be gained using hands-on experience.

Furthermore, Participant 5, when stating the importance of knowledge management, stated that inherent capacity to do the work is a fundamental aspect in the organization. In addition, Participant 5 said, "this type of job that we do here coordinating the corporate exhibits nationally and internationally is knowledge based process that requires a lot experience and a lot of knowledge because it is a type of event management of coordination it is important"

Finally, Participant 6 noted that "there is a lot of very specific tasks that are involved my job is very different than other people's jobs so not only is it important for me to know all those little things that are involved multi business lines not dealing with business lines but internally is well having to go up on our line for approval and also just in general as well as there the key things". Therefore, Participant 6 outlined that they believe that inherent knowledge or implicit knowledge is crucial.

Providing the above insights, the participants have highlighted that not only is implicit knowledge more important, the nature of work done in the organisation is based on implicit knowledge. Implicit knowledge not only allows the employees to complete organisational tasks with greater efficiency, but also enables them to maintain inter-departmental coordination, and focus on internal relationship management with peers and superiors alike.

The findings of this study, with regards to the importance that is placed on implicit knowledge, confirm the extant literature. In other words, implicit knowledge is one of the most fundamental types of knowledge. For instance, it was noted by Webb (1998) and Civi (2000) that tacit

knowledge consists of the personal values, individual differences which cannot be transmitted efficiently, whereas explicit knowledge is can be converted into or transferred via data, formula, manuals or specifications. Moreover, Edwards (2015) highlighted that tacit knowledge can be found at the centre of knowledge and explicit knowledge forms the fence around the centre. However, tacit and explicit knowledge work together to create knowledge (Nonaka, 1994). Here, it is important to note that tacit and explicit knowledge are not mutually exclusive and work together in varying degrees to generate the desired outcome (Spender, 2015). Therefore, based on the literature and the results of this research, it can be confirmed that implicit knowledge is one of the most important categories of knowledge which can enable employees to contribute significantly to their own work and to the organisation.

Sharing Implicit Knowledge is Important

In addition, the study also found that the general consensus amongst the participants was that the sharing of this implicit knowledge is important. Overall, the participants noted that sharing implicit knowledge is important to ensure that the knowledge is maintained in the organisation as well as to ensure that all of the employees, new or old, are contributing positively to the organisation.

Several participants outlined that in the organisation, there is no process whereby implicit knowledge can be shared to younger and newer employees. This poses an issue when the older, more experienced staff exit the company, thereby taking all the implicit knowledge with them in the process. Without an appropriate knowledge sharing process, important implicit knowledge will be lost.

For instance, Participant 4 noted that, “We employ a wealth of experienced staff globally and those ex patriates will eventually move on and often without any formal opportunity to hand over their practical experience Or the case studies or project experience to those with less experience.” According to Participant 4, it is important to share knowledge so that colleagues with less experience can benefit from the knowledge that a more experienced person has. In this respect, Participant 3 noted that the organization should play a bigger role in facilitating the transfer of implicit knowledge so that it is available to all employees to use when required.

Furthermore, echoing the importance of implicit knowledge, Participant 3 stated that it is very important to share the knowledge among employees as this allows them to take further initiatives that they would not have taken otherwise. In addition, Participant 1 noted, "If someone works for ten years in that company, the work that they did was for the company was for that company so in a certain way the knowledge that they did it technical knowledge, operational knowledge, strategic knowledge, people knowledge, cultural knowledge, it is company property it's company intellectual knowledge. All these different types of information that they get in the course of their time here really in my mind is company property and it's their responsibility to reap the benefit that they got." In other words, Participant 1 noted that the knowledge, whether implicit or explicit, that an employee gains is part of the company's assets and as such should be retained in the company. Therefore, the participant highlighted the importance of sharing implicit knowledge. Finally, Participant 6 outlined that the company needed to carry out routine functions such as holding weekly reporting so that highly skilled and knowledgeable people can send out information-filled sheets which will educate everyone and help them better perform their job.

In the context of Saudi Aramco, knowledge is seen to be a possession which people take with them when they leave. Without the effective sharing of this possession with other members of staff, the organisation loses the valuable knowledge. This can mean that the new staff will have to spend time in order to gain organisation-related experience, since most of the work done is based on implicit knowledge, which will then lead to lags in performance and impact the efficiency of the work being done. Such disruptions can be especially limiting towards the service delivery levels that are expected.

From the above discussion, this view that the participants have of knowledge as being something that is possessed by the entity or organization has its basis in the epistemology of possession (Newell et al., 2009). Furthermore, in accordance with David & Fahey (2000), KM is essential for organisations as the knowledge that was once relevant in the near or distant past, may no longer be applicable in the times to come as the market finds itself rapidly changing. Moreover, Du Plessis (2007) states that the KM procedure has the objective to enhance the skill of an organisation to implement its essential procedures in a successful manner. In addition, Gold & Malhotra (2001) highlight that KM is a consistent procedure to comprehend the knowledge requirements of the organisation, the accessibility of knowledge and the means to enhance knowledge. Finally, it was

noted by Lyu, Zhou, & Zhang (2016) that knowledge is recognised as a central economic resource, a commodity and an organisational asset which is linked to organisational advancement. Therefore, it can be stated that there is general agreement of the importance of knowledge sharing and management of the findings of this study and that of past studies.

Knowledge Management Enhances Efficiency

Several participants recognized that one of the primary benefits of effective knowledge management is an enhanced efficiency at the workplace. Participant 1 noted that, due to the fact that an employee understands the ins and outs of the organisation, they are able to establish contacts, understand the different cultures in the organisation, and gain institutional knowledge which helps them in performing their work in a better and more efficient manner.

Furthermore, Participant 11 thought that knowledge management is crucial because "we are constantly trying out new things and bringing in new business activities, so to ensure that there is efficiency, we need to have people who are capable of doing the work." In a similar light, Participant 17 stated that, "I think there is a wealth of experience and we have a number of young employees that have joined us, and so I think that there is very important to have these kind of programmes to make sure that we are transferring the knowledge to our young staff, this will help a lot in minimising our operation time."

In addition to retaining implicit knowledge in the organisation even after the employee possessing that knowledge has left the organisation, the importance of KM programs can be seen in reduction of the operation time for the organisation. This is applicable when there are new staff coming in and they need to become acquainted with the systems, processes, and other aspects of the organisation in a timely manner to avoid loss of time. Furthermore, effective knowledge management also facilitates developing new concepts and thinking of innovative aspects which then enhance efficiency. Furthermore, effective knowledge management can also enhance the performance of an employee by providing channels of efficiency. For instance, Participant 22 noted that effective KM programs will allow them to share and access information through the sharing platforms such as Google Docs, which allows widespread collaboration and generates efficiency. In addition, the participant also noted that effective KM will allow employees to exploit

knowledge that is localized and hence, enhance their performance. Similarly, Participant 26 highlighted that sharing knowledge will allow the staff to make fewer mistakes.

Finally, Participant 25 said, "Yes, I believe it will increase the productivity of the work force. Knowledge is crucial and is often undocumented. Which means that even though knowledge exists, we don't access it most of the time. Imagine how many man-hours we will save if we have a good knowledge management system".

The above views of the participants and thus of the organization are in line with the conceptualization of knowledge by Newell et al. (2009) who noted that knowledge can be applied to processes in an effort to enhance efficiency. This could be said to be due to the fact that KM is an important aspect of an organisation since it seeks to clarify to employees the role of organisational knowledge to the organisation's success and allows them to use the same effectively (Kulkarni, & St Louis, 2003).

Knowledge Management Platforms are Necessary

All of the participants noted that KM platforms in the organization are necessary to ensure effective transfer and management of knowledge in the organization. Participant 2 noted that, "Our company is different than the rest so even just being able to work here for an employee has happened due to knowledge transfer and knowledge management on behalf of the team that they work in. Even if the person comes from a similar company, still they have to undergo a learning curve. That is facilitated by the company." In addition, Participant 3 also highlighted that the organization should play a bigger role in the transfer of knowledge. They stated, "I think corporation should play a much bigger role in making sure that knowledge is spread out among the employees and nowadays there are a lot of platforms; there has to be some knowledge platforms that helps employees to share knowledge right now."

KM platforms are necessary due to the limited amount of learning curves and trial and error processes that the employees have to go though in the absence of such KM processes. Where such systems exist, the organisation can ensure that relevant knowledge and information reaches those that need the knowledge to help them render the process more efficient. In addition, KM is also of important consideration when the job requires a certain expertise, especially for complex tasks.

This was outlined by Participant 6 who highlighted the importance of having a KM system due to the fact that, "I mean there are a lot of very specific tasks that are involved. My job is very different than other people's jobs, so not only is it important for me to know all those little things that are involved multi-business lines, but also be aware of what is happening in the bigger picture." From this, it can be noted that participants highlight that they need to transfer knowledge appropriately to their subordinates due to the unique nature of the job.

Furthermore, other participants also highlighted various reasons why they think that KM platforms are an important requirement. For instance, Participant 6 noted, "It is important to teach your subordinates what they need to do for managing the operations in your absence." On the other hand, Participant 10 simply noted that, "Without knowledge management or proper management there is no proper knowledge".

Participant 14 associated an organization to be a living thing and noted that, "Organisations are living breathing things and over time knowledge is passed on from through an organisation so it can continue to progress and reach its goals." Furthermore, Participant 21 noted that when knowledge is not managed using proper platforms and methods, it results in a critical point. They said, "There is a criticality that happens when information is not transformed properly from one to another. That sort of disconnect has to be avoided if the company has to function properly." Here, it needs to be established the information is not the same as knowledge. Information can be defined as stored data that can be interpreted and which has a specific purpose (Terra and Angeloni, 2003). On the other hand, knowledge has been defined as a combination of contextual information, fluid experiences, and values that allow the incorporation of new information (Davenport and Prusak, 1998).

Few other participants noted that KM platforms are necessary because they facilitate the retention of information in the organization. For example, Participant 19 highlighted that, it is important to create the awareness of the company procedures in the organisation so that we have work done that is according to the operations." The same was also echoed by Participant 16. Finally, Participant 20 noted that, "the older people will leave the company and the young need to function in the absence of the old. So that's why knowledge management is important to keep the information in the company and come up with new things."

Due to organisations being dynamic in nature, they need to continuously grow in order to gain better profitability. This can only be facilitated when there is appropriate sharing of information and knowledge across any two given points in the organisation. In addition, succession planning can be facilitated with the aid of an effective KM platform as it can make sure that the knowledge remains within the company even if the employee does not.

From the above, it can be seen that while there is no unanimous understanding of what knowledge means, it is being used interchangeably with information (Faucher et al., 2008). However, most of the benefits that have been identified are in line with the idea that KM is an essential driver of efficiency across organisations (Bousa and Venkatichalam, 2013). Furthermore, the views of the participants support the fact that KM is necessary for the organisation to thrive and survive in the competitive market (Kamhawi, 2012; Martensson (2000). Because much of KM is driven by the need to develop long-term operational strategies (Greiner et al., 2007), the recognition that KM brings benefits such as those listed above is a positive indication of the organisational culture with respect to knowledge sharing. This is so because there is a clear link between organisational culture and effective KM (Desouza and Paquette, 2011). In other words, any KM framework or system can be established in using technology in an organisation, but for it to generate any value, individuals need to overcome their reluctance to share knowledge (King, 2007) and hoard knowledge (Hislop, 2013). This requires a significant paradigm shift from an individualistic to a collective mindset on behalf of the employees. Since all of the participants in this study believe in and understand the benefits of KM, it can be stated that the organisational culture supports knowledge sharing.

Nature of Current Knowledge Transfer in Saudi Aramco

The participants provided information about the nature of knowledge transfer in the organization and if the current culture of the organization facilitates the same. For instance, Participant 1 noted that according to their perspective, “it’s highly recommended because so often people that leave either they move to another organisation or they retire and when that person is gone, so is the knowledge.”

Furthermore, Participant 3 noted that if the knowledge is not shared, then it will be lost and the organization will be lacking in knowledge. They said, “If you don’t have the means or the mechanism that transfers to the younger generation, you will end up with lack of knowledge.”

Participant 8 provided a comprehensive response stating that, “It is essential because, what’s happening is we’ve got a great cruise shift, we have a lot of very experienced people who are leaving the company, and they are taking that knowledge with them and we are getting a lot of younger people, who never worked in the industry before. Who don’t know all the unwritten rules and even basic terms and definitions of terminology, a lot of our older employees didn’t start in HR or PR, they started out in the field they were technical people they worked on the oil rigs, they were engineers, they gradually got into this part of the company. So, they have a different background in the oil and gas industry. Many people have never been near an oil well.”

Several other participants also noted the same and stated that knowledge transfer is encouraged and recommended in the organisation. It can be noted that one of the primary reasons why this was thought to be the case was for the retention of knowledge in the organisation. However, with that being said, one of the participants noted that there was no official opportunity for the employees to share knowledge with one another.

The organisation has been trying to establish an efficient KM platform for several years. The organisation and its culture do support the process of KM and understand the importance of knowledge sharing. Knowledge sharing has been identified as being necessary in Saudi Aramco to share tacit knowledge, valuable organisational information, and aid in reduction of repetitive work, retain the intellectual capital of the organisation, and allow the organisation to maintain competitiveness in a highly dynamic market (Epetimehin and Ekundayo, 2011). Furthermore, Omotayo (2015) has also stated that the need for knowledge transfer in an organisation is also due to an aging workforce that has accumulated a vast amount of knowledge which can be potentially lost if effective knowledge transfer is not initiated in a timely manner. This is in line with the attitudes and beliefs of the participants in Saudi Aramco. Many of the participants also focused on the transfer of tacit knowledge. The transfer of tacit knowledge can reduce the downtime that a new employee will need in the event that he/she did not know any of the company’s inner workings.

4.2.2. Presence of an Existing Knowledge Management Framework in Saudi Aramco

As the interview progressed, the next step in the questionnaire was to identify if Saudi Aramco currently has a KM framework in place. Almost all of the participants stated that there is no such framework that currently exists in Saudi Aramco. However, some of the participants hinted at there being some initiative.

Participant 1 noted, "No, but I had heard of some initiative along the same lines. Although, it was not a framework but more like a database and the focus was not on transfer of knowledge but on the capture of knowledge. For example, if we hire an external consultancy organisation to do something and they create presentations for us and give us the presentations, then we say we have a knowledge database that anyone can access and learn from. But it was not a framework."

In addition, Participant 5 highlighted that the culture of the organization leads to a greater accumulation of knowledge with the more experienced employees which is reflective of poor knowledge management in the organization. On the other hand, Participant 14 outlined that, "I think to a degree you can point to a number of things in Saudi Aramco that measure individual's knowledge; mainly tied to things like goal setting and performance. And I think a by-product of that is a measurement of an individual's knowledge."

Moreover, Participant 17 said that, "Well, as far as I know, there are programmes that manages the transfer in knowledge and that monitors the progress, but it's not a framework." Similarly, Participant 18 noted that, "Yes, the competency index shows the knowledge trend and the level of competency is efficient knowledge management."

It can be seen that while all of the participants agree that there is no organisation-wide framework, some participants have pointed to department-based initiatives. However, the effort of KM is sporadic at best. While these initiatives don't precisely measure KM and IKM and focus on indirect parameters such as job performance and level of experience, it does show that the organisation is in need of a uniform framework that can streamline internal processes. Furthermore, an interesting point to note is that there is a risk of simplicity of measuring work experience length as organisational knowledge base. This was similarly found in the job title of the person where the individual with the highest grade is automatically assumed to have greater knowledge.

The presence of a knowledge database (as pointed out by P1) is also a crucial KM strategy. For instance, the capacity for individuals to search for codified knowledge as and when they require it can promote better learning and performance (Choo, 2002). The lack of any well-established framework in the organisation can be linked to the fact that "organisations do not suffer from a lack of knowledge but rather from ways/means of accessing and exploiting knowledge" (Omotayo, 2015, p. 17).

4.2.3. Integration of knowledge dimensions into compensation and reward system

Most of the participants stated that they would like to see some form of reward or compensation, but did not provide any further details. Some participants also provided more details as to the nature of the compensation and reward. However, some, participants did not think it important to have a reward or compensation system. For instance, Participant 1 noted that, "All these different types of information that they get in the course of their time here really in my mind is company property. Ultimately, it's their responsibility to reap the benefits that they got. I don't think there should be a reward for such knowledge. I think it's an intellectual asset that belongs to the company especially in terms of mentorship."

Similarly, Participant 8 said, "No, I don't agree with that, philosophically, I believe that anyone and I'm talking about expats that come here; I consider them to be temporary workers, in the sense that they're filling a skill gap and it's my responsibility as a person who wants to help build the kingdom, to transfer that knowledge so that a Saudi can take that knowledge and do it well, and succeed at it. The goal should always be to train other people because there is no such thing as a person who is irreplaceable."

On the other hand, Participant 23 said that without appropriate incentives, employees would not engage in knowledge transfer. They highlighted, "You know, I don't know if it's possible to be effective in knowledge transfer without being some sort of reward or recognition in our department. It's not like marketing department, for example, we require some type of integration with the PMP so that if were doing knowledge transfer, we want people to be rewarded for it and we want it to be tied in to their specific goals. So when we setup a knowledge transfer framework in our department we need to create a goal for everyone involved in that. People won't volunteer for it otherwise unless it allowed them to meet some performance goals that they have."

On the other hand, Participant 3 outlined that there needs to be some form of motivation, "I think we can do it to encourage more knowledge transfer. For example, we have different personalities and as such, interaction is difficult for some people. They may know a lot but have a shy personality and may not share their knowledge with others. So, in this respect, we can establish something to enforce knowledge transfer."

Some critical points have been raised by the participants who do not believe that knowledge transfer should be incentivised. In essence, the belief is that knowledge sharing should be part of one's responsibilities and not something that needs to be incentivised. This view was not supported by the majority as they believed that there needs to be a push when it comes to knowledge sharing because people are not going to volunteer the knowledge transfer that they have gained over time. However, providing financial incentives was not the ideal path according to all of the participants. This can be evidenced in the sense most of the participants have suggested setting of goals, developing recognition systems, having formal methods for sharing knowledge, and encouragement as the ideal approaches to creating a reward system for sharing of knowledge.

The importance of reward systems and incentives has been considered a crucial aspect of a KM strategy (Cabrera and Cabrera, 2005; Olatokun and Nwafor, 2012). Olatokun and Nwafor (2012) also noted that when it comes to reward systems and incentives, people who are intrinsically motivated to pass on knowledge perform better than people who have been provided incentives. This is in line with what the participants have suggested in the above table. It also further points to the notion that KM is a cultural and social phenomenon that is ultimately driven by people and not strategy (Hislop, 2013).

4.2.4. Attitude towards implementation of MinK

After gaining the responses to all of the questions of the interview, it was briefly explained to the participants what the framework's objective was and what it could achieve. Following this, the participants were asked if they would like to see the MinK framework being implemented in the organisation. All of the participants were in complete agreement and stated that it would be beneficial as there was a need for a unified framework. One participant, P22, said that, "Yes, I think it's really important because we have to understand who has this individual knowledge so

we can as we say work with this guy to transfer the information from him to another. If we don't know who will have the knowledge it will be really difficult for us to transfer the knowledge so I think we have to know who needs the knowledge."

P3, noted, "Since there are many frameworks for different processes in the organisation already, we do not need a new complex framework. Otherwise people will get fed up about it. It needs to be simple and easily manageable to be able to be effective."

In line with this, the participants were asked for consent to participate in a short survey which was for the purposes of data collection in preparation of the second phase of the action research cycle one using the MinK framework.

4.3. Mapping the Terrain – Phase Two

As has been noted above, this research attempted mapping the terrain in the previous phase of the research which provided essential information into the organisation, its culture, and its strategy towards the implementation of a KM framework for better knowledge transfer, retention, and pinpointing the presence of knowledge.

This section provides the results of the operationalisation of MinK framework in the Public Relations department of Saudi's Aramco. At the end of the semi-structured interview during the terrain mapping process, the participants were recruited with informed consent for participating in the assessment of their individual knowledge. The MinK questionnaire (see Appendix B) was circulated to each of the participants. The raw data of the MinK Assessment and overall result can be seen in (Appendix C) and (Appendix D) respectively.

4.3.1. Data Collection and Analysis

The MinK Framework measures individual knowledge in the following areas: experience, education, training, IT literacy, business communications, business process interactions, personal network, work performance, creativity and innovation, and willingness to share. A questionnaire adopted from the framework allows the measurement of these parameters. This questionnaire was circulated to the same sample of participants who participated in the exploratory, semi-structured qualitative interviews. In other words, data was collected from 26 participants in a 360 degree

manner which effectively brought the sample size to 104. Each of the ten parameters consisted of 2 to 4 items that were rated on a scale of 1 to 7 with varying options based on the context. The questionnaire that was developed is provided in Appendix D.

4.3.2. Results

The results of the factors considered here are experience, education, training, IT literacy, business communications, business process interactions, personal network, work performance, creativity and innovation, and willingness to share. The calculation was carried out as stipulated by Ragab and Arisha (2014). There are three aggregate processes that take place before the calculation of the overall IK Index. The first step is to add all of the values of the individual items that make up the constructs. This will generate the total rating per appraiser for each individual construct. The second step is to develop an aggregated average which multiplies the item ratings with the weight of each of the metrics. The weight of the metrics is outlined in the below table.

Table 4.1: Metric weights

IKI Weights	
Experience	10%
Education	10%
Training	10%
IT Literacy	5%
Business Communications	10%
Business Process Interactions	10%
Personal Network	10%
Work Performance	25%
Creativity & Innovation	10%
Market Value	0%

Following this, the final step of the process is to develop the overall score by using the individual score aggregates calculated before and multiplying them with the willingness to share knowledge coefficient that was measured as part of the questionnaire. Willingness to share coefficient is a factor which can influence the results of the IK1 significantly. For instance, if the IK score of

Participant A was lower than B, but if A had a higher willingness to share coefficient, then Participant A will display an overall higher score for the overall IKA (Ragab and Arisha, 2014).

The below table represents the overall Saudi Aramco indicator weights for each of the factors in comparison to the expert ranges that have been set forth by Ragab and Arisha (2014).

Table 4.2: MinK Index Indictor Weights vs Saudi Aramco Results

MinK Index Indicator Weights		**Expert Ranges**	**Saudi Aramco Results**
Background Indicators	Experience	10 - 18%	15%
	Education	8 - 15%	10.0%
	Training	5 - 15%	10.0%
	IT Literacy	3 - 6%	6.00%
Knowledge Transfer Indicators	Business Communications	5 - 20%	10%
	Business Process Interactions	5 - 15%	5%
	Personal Network	3 - 13%	3%
Output Indicators	Work Performance	10 - 30%	22%
	Creativity & Innovation	10 - 20%	14%
Market Value Indicator	Remuneration	5 -15%	5%
		TOTAL	**100%**

From the above table, it can be seen that most of the indicator weights for Saudi Aramco lie within the established threshold.

The below table shows the management team's decision in allocating the appraiser weights. As can be seen, the participants were asked to rate the relative importance of appraising self, peers, managers, and subordinates. From the below table, it can be seen that more weight is allocated to the assessment of managers since managers have more experience to make more accurate judgments about individuals other than the other appraisers. On the other hand, self-assessment is given the least weight because management believes that they can be influenced by self-bias.

Table 4.3: Appraiser Weights

Appraiser	Weight
Self	**10.0%**
Manager (Supervisor)	**50.0%**
Subordinate	**20.0%**
Peer (Co-workers)	**20.0%**
Total	**100.0%**

Experience Construct

The mean of variable 'experience' has been calculated and is found to be 4.91. As is evident from the below table, there are 14 employees out of 26 having higher value than mean. This means that on average, the participants have more than 5 years of experience.

Also, the mean for IK index is obtained as 5.07, where 13 employees have a higher value than the mean. When comparing this with the experience variable, it is found that 11 of the employees with a higher level of experience have a high IK index. The remaining 3, however, have IK less than the mean value. As the majority of the employees with high experience have a high IK index, it is inferred that the experience of an employee corresponds to high individual knowledge. However, this conclusion is a speculation at best because other factors that are not accounted for in this framework could also influence the results.

However, as past studies indicate, it can be evaluated that more experienced persons do not find it difficult to maintain and sustain the gained knowledge and enhance their knowledge as well without any impediments (Chawla & Joshi, 2010). In other words, it can be said that people with more experience tend to generate and sustain more implicit knowledge as it is associated with a person's work experience.

Table 4.4: Experience Index results

Participants	Experience	IK Index
P1	5.00	6.26
P2	5.00	5.20
P3	3.75	4.55
P4	6.00	5.12
P5	6.38	5.68
P6	5.00	5.16
P7	5.75	6.30
P8	3.19	4.94
P9	3.00	4.22
P10	7.00	6.60
P11	6.25	5.41
P12	6.00	4.61
P13	3.50	2.96

P14	3.75	4.72
P15	3.75	5.07
P16	5.00	5.00
P17	6.31	5.27
P18	4.25	4.53
P19	4.25	5.46
P20	4.06	4.56
P21	4.25	4.81
P22	6.00	5.47
P23	3.50	4.89
P24	3.81	4.69
P25	6.06	5.44
P26	6.75	4.84
Mean	**4.91**	**5.07**

Education Construct

The table below depicts that the mean value for education is 4.50, where 14 of the employees have higher values than the mean. Therefore, the majority of the employees are well educated. When comparing the level of education with IK index, it is observed that 7 of the 14 employees with high education have low IK value. On the contrary, the remaining 7 employees have a high IK value. Due to the 50-50 dichotomy in the IK index results of the participants, it cannot be definitively assumed whether there is an influence of education on the overall knowledge index of a person.

Table 4.5: Education Index results

Participants	Education	IK-INDEX
P1	4.33	6.26
P2	3.00	5.20
P3	4.67	4.55
P4	3.67	5.12
P5	4.50	5.68
P6	4.00	5.16
P7	6.00	6.30
P8	3.58	4.94
P9	3.00	4.22
P10	7.00	6.60
P11	4.67	5.41
P12	4.67	4.61
P13	4.00	2.96
P14	5.67	4.72
P15	4.33	5.07

P16	5.00	5.00
P17	6.50	5.27
P18	4.00	4.53
P19	4.50	5.46
P20	4.50	4.56
P21	4.50	4.81
P22	4.67	5.47
P23	5.33	4.89
P24	4.08	4.69
P25	3.83	5.44
P26	3.08	4.84
Mean	**4.50**	**5.07**

Training Construct

The mean value for training is 4.08, and 12 of the employees have values higher than the mean. This implies that the remaining 14 employees have lower level of training. Therefore, the majority of the employees are not provided with regular training. Considering the relation between training and IK index, 10 of the employees with high level of training have high IK index; and the other 2 employees with high training have low IK index.

The analysis reveals that training is positively related with IK index, where regular training increases the individual knowledge of the employees. However, as evident from the below table, most of the employees have low value. As the number of employees with training is less, it is suggested to provide more rigorous training to all so as to enhance their IK.

When this data has been compared with the previous research, it has been evaluated that the employees - irrespective of any multinational companies and field - need proper training on task-specific knowledge to increase their proficiency. This would also allow the professionals to make quicker and superior choices compared with the non-professionals in terms of solving intricate issues.

In many cases, it has been noticed that the employees fail to explain a particular concept regarding their work profile (Barth, 2000). This is because staff need proper training to make use of the knowledge management system in their company efficiently (Dwivedi *et al*., 2011). Through training, the employees would be able to learn about the knowledge management system that is needed in their work to maintain sustainability and growth in the organisations.

Furthermore, the kind of training also matters. In other words, experiential learning can be said to promote knowledge generation and sustainability. Furthermore, if the training that is carried out does not have any practical implications, then it might not increase the knowledge index of the participants.

Table 4.6: Training Index results

Participants	**Training**	**IK-INDEX**
P1	7.00	6.26
P2	6.33	5.20
P3	3.33	4.55
P4	6.00	5.12
P5	5.50	5.68
P6	3.00	5.16
P7	6.00	6.30

P8	2.83	4.94
P9	3.00	4.22
P10	6.33	6.60
P11	2.67	5.41
P12	1.00	4.61
P13	2.67	2.96
P14	2.67	4.72
P15	2.67	5.07
P16	5.00	5.00
P17	4.50	5.27
P18	2.50	4.53
P19	5.00	5.46
P20	4.00	4.56
P21	3.25	4.81
P22	4.67	5.47
P23	3.00	4.89
P24	1.75	4.69
P25	5.75	5.44
P26	5.58	4.84

Mean	**4.08**	**5.07**

From the above, there is a need of proper gaining of knowledge through sharing or training to face such situations or uncertainties and meet with success. By comparing this with the existing research work of BenMoussa (2009), it has been understood that there are certain barriers which create obstacles in the successful application of knowledge management in an organisation. As with the opinions of the interviewees, the following research study has revealed that planning, enabling, motivating and personal barriers like time and effort are the barriers to knowledge management (Frappaolo, 2006). There is a need for proper planning to execute knowledge management training so that the knowledge can be shared or communicated among the individuals of the organisations. Besides planning, there should be a proper way of enabling the sharing of knowledge among the people (Kalling, 2003). For instance, organisations can implement information technologies to share knowledge. Lack of motivation may also create an obstacle for the organisation for which every company should motivate their staff to contribute in the efforts for knowledge management and share their opinions on the same (Riege and Linsay, 2006).

IT Literacy Construct

The mean value for IT literacy is 4.97, where 14 of the employees have high IT literacy as their corresponding values are higher than the mean value. It is noteworthy to comprehend the relationship between this variable and IK index, and as evident from the above table, 7 of the employees with high IT literacy have high IK index. The remaining 7 employees have IK index lower than the mean value. The results indicate that IT literacy and IK form a neutral relationship, with neither positive nor negative impacts. Therefore, there is no prominent relationship between the two indicators.

This denotes that IK index and IT literacy have a neutral relation among them which has neither negative nor positive results. Thus, it can be inferred that the IT literacy is not essential in terms of gaining individual knowledge regarding the knowledge management system in a company. Though it can be said that it plays an important role in enhancing the implicit knowledge of the participants, it does not imply that there is an overall relevance to gaining IT literacy skills towards the individual knowledge of the person.

Table 4.7: IT Literacy Index results

Participants	IT Literacy	IK-INDEX
P1	6.00	6.26
P2	5.00	5.20
P3	6.00	4.55
P4	6.50	5.12
P5	5.00	5.68
P6	4.00	5.16
P7	6.25	6.30
P8	4.50	4.94
P9	3.00	4.22
P10	4.50	6.60
P11	6.50	5.41
P12	5.00	4.61
P13	3.50	2.96
P14	6.00	4.72
P15	4.50	5.07
P16	5.00	5.00
P17	4.63	5.27

P18	3.13	4.53
P19	4.63	5.46
P20	4.63	4.56
P21	5.75	4.81
P22	4.00	5.47
P23	5.00	4.89
P24	4.13	4.69
P25	6.00	5.44
P26	6.00	4.84
Mean	**4.97**	**5.07**

It can be understood that to maintain a proper knowledge management process, one has to be flexible with the right technology, as a result of which, speed and accuracy will automatically increase (Franco & Mariano, 2007). There should be a suitable technology infrastructure with proper implementation of hardware and software to enhance the process of knowledge management (Lee & Hong, 2002). Thus, it can be concluded that technology plays an important role in terms of developing knowledge management processes in an organisation.

Business Communication

The mean value for business communications is 5.26, where 14 of the employees have higher value of business communications than the mean. When comparing with the IK index, 11 of the employees with high business communications have high IK index, thus establishing a relation between the two indicators.

Further, the employee with the lowest value of business communications (2.70) has the lowest IK index (2.96). It is concluded that business communications positively affects individual knowledge of the employees.

This has also been compared with the established secondary research studies which reveal that widespread business communication is needed in the organisations to share specific knowledge among the people through different means like emails, chat rooms, online discussions, video conferences and audio (Zeleny, 2002). Without a proper communication system, organisations face several issues at executive, legal and judicial levels for which an enhanced electronic work setting is needed. This would reduce the workforce and help the organisations to manage the high workloads. Through a proper intranet connection, staff can enhance their business communication and help clients to access information or read data. Henceforth, it can be inferred that business communication affects the individual knowledge of the staff. Business communication can be said to enhance the implicit and explicit knowledge of the staff by promoting the practice of knowledge sharing.

Table 4.8: Business Communication Index results

Participants	**Business Communications**	**IK-INDEX**
P1	6.79	6.26
P2	5.21	5.20
P3	4.74	4.55
P4	4.93	5.12
P5	5.97	5.68
P6	5.81	5.16
P7	6.50	6.30

P8	5.46	4.94
P9	4.94	4.22
P10	6.73	6.60
P11	5.55	5.41
P12	4.44	4.61
P13	2.70	2.96
P14	4.28	4.72
P15	5.44	5.07
P16	5.00	5.00
P17	5.36	5.27
P18	4.84	4.53
P19	6.06	5.46
P20	4.72	4.56
P21	5.01	4.81
P22	5.73	5.47
P23	5.28	4.89
P24	5.53	4.69
P25	5.38	5.44
P26	4.44	4.84

Mean	**5.26**	**5.07**

Business Process Interactions

The mean value for business process interaction is 4.40, where 16 of the employees have higher value than the mean value. Therefore, majority of the employees have high interaction between the business processes.

12 out of these 16 employees have high IK index, thus contributing to the result that, business process interactions are positively related with individual knowledge. With higher interaction, the employees can improve and strengthen their individual knowledge. This variable has the highest number of employees having high vales corresponding to the variable.

Henceforth, it can be said that people with high interactions in a business process can strengthen and improve individual knowledge. By comparing this result with the secondary research work, it has been analysed that people with proper business interactions can modify their work pattern through enhanced teamwork. Through business process interactions, the knowledge management system allows others to interact with each other on the basis of knowledge (Nonaka, 1994). Henceforth, there is a need for interaction between human skills and technology in business to come out with positive results in terms of knowledge management. The business process communication refers to the important communication which should take place between the individual persons and the business process both extrinsically and intrinsically (Riege & Lindsay, 2006).

Table 4.9: Business Process Interactions Index results

Participants	**Business Process Interactions**	**IK-INDEX**
P1	6.75	6.26
P2	5.00	5.20

P3	4.63	4.55
P4	4.56	5.12
P5	5.70	5.68
P6	4.56	5.16
P7	6.50	6.30
P8	4.00	4.94
P9	4.75	4.22
P10	6.31	6.60
P11	5.13	5.41
P12	3.25	4.61
P13	1.00	2.96
P14	1.75	4.72
P15	3.75	5.07
P16	5.00	5.00
P17	4.40	5.27
P18	3.60	4.53
P19	6.00	5.46
P20	2.00	4.56
P21	3.45	4.81

P22	5.44	5.47
P23	4.25	4.89
P24	4.80	4.69
P25	4.81	5.44
P26	3.00	4.84
Mean	**4.40**	**5.07**

Personal Network Construct

The mean of the variable personal network is 5.04, where 14 of the employees have high personal network than the mean value. In comparison with the IK index, 10 of the employees having high personal network have high IK index. The remaining 4 of the employees with high values of personal network have IK index lower than the mean value.

The results clearly indicate a positive relation between the indicators, where higher personal network contributes to enriched individual knowledge.

This shows that there is a positive relationship between the personal network and enriched individual knowledge. Henceforth, it can be said that the personal network of the staff contributes to developing individual knowledge of the people. By comparing this result with the literature review section of the study, it can be understood that more the people have a network in office or business contacts with friends and individuals, the more they can learn or gain individual knowledge (Wiig, 2002). Henceforth, it is crucial to develop individual network in the business place to enhance the knowledge or manage the knowledge and skills within oneself. This can be correlated with essential implicit knowledge transfer due to engaging with colleagues and engaging in knowledge sharing. This can also be said to be due to the willingness to share information and knowledge.

Table 4.10: Business Process Interactions Index results

Participants	Personal Network	IK-INDEX
P1	6.75	6.26
P2	4.50	5.20
P3	4.06	4.55
P4	4.50	5.12
P5	5.55	5.68
P6	5.94	5.16
P7	6.50	6.30
P8	5.25	4.94
P9	5.00	4.22
P10	6.63	6.60
P11	4.44	5.41
P12	4.00	4.61
P13	2.19	2.96
P14	2.88	4.72
P15	6.00	5.07
P16	5.00	5.00
P17	5.15	5.27
P18	3.75	4.53

P19	5.85	5.46
P20	4.63	4.56
P21	5.60	4.81
P22	5.63	5.47
P23	6.13	4.89
P24	5.80	4.69
P25	5.19	5.44
P26	4.25	4.84
Mean	**5.04**	**5.07**

Sometimes, personal barriers also create an issue in delivering proper knowledge management efforts or sharing the information among other team members. For instance, lack of usefulness or giving proper time and effort in developing the knowledge management system or sharing it among the individuals are the identified obstacles in the existing literature studies (Lin & Tseng, 2005).

Work Performance

The mean value for work performance is 5.94, where 13 of the employees have good work performance as their corresponding values are higher than the mean. 9 of these employees with high work performance have high IK index, while the other 4 have IK index lower than the mean.

It is also essential to note, that the employee with lowest work performance (3.63) has lowest IK index (2.96). This implies that work performance affects one's individual knowledge, and with higher performance the IK increases.

This has implied that a proper work performance enhances the knowledge of the employees and due to high performance, the IK index also increases. By comparing this with the previous literature-based studies, it has been understood that the performance of the individual employees at the workplace is effective in enhancing the level of knowledge (Leidner et al., 2010). Their enhanced productivity along with their performance would help them in gaining knowledge in the organisation.

It has been understood evaluating the work performance of the employees may contribute to the knowledge sharing in an organisation (Anand & Singh, 2011). By linking this with the sub-themes of the qualitative results of the study, it has been evaluated that if the employees are motivated, then they are willing to share the knowledge among other employees in their team. Early studies have shown that performance management and appraisal are linked with the knowledge sharing in the organisations (Fong et al., 2011). With better performance appraisal, employees can gain some information regarding the needs of knowledge sharing. Knowledge sharing is also linked with the incentive system which aims at increasing the employee motivation (Ishak et al., 2010).

In addition, another way of looking at these results is that if an individual has a high knowledge index, then it can positively impact their performance at work. In other words, these individuals may perform more efficiently due to a high IK index.

Table 4.11: Business Process Interactions Index results

Participants	**Work Performance**	**IK-INDEX**
P1	7.00	6.26
P2	6.00	5.20
P3	5.13	4.55
P4	5.75	5.12

P5	5.90	5.68
P6	6.75	5.16
P7	6.50	6.30
P8	6.60	4.94
P9	5.00	4.22
P10	7.00	6.60
P11	6.63	5.41
P12	6.50	4.61
P13	3.63	2.96
P14	6.75	4.72
P15	7.00	5.07
P16	5.00	5.00
P17	5.30	5.27
P18	6.00	4.53
P19	6.00	5.46
P20	5.75	4.56
P21	5.40	4.81
P22	5.88	5.47
P23	5.50	4.89

P24	5.70	4.69
P25	6.25	5.44
P26	5.50	4.84
Mean	**5.94**	**5.07**

Creativity and Innovation Construct

The mean value for creativity and innovation is 5.15, where a minority of 12 employees has higher values than the mean. This implies that most of the employees are not tapping into their creative and innovative drives.

When compared with the IK values, 8 of the employees with a high level of creativity and innovation have a high IK index. The remaining 4 have low IK index. On the contrary, considering the employees with low creativity and innovation, 5 of them have high IK index. Therefore, it is observed that though creativity and innovation contributing to enhanced individual knowledge, most of the employees are less creative and innovative. Therefore, the employees must consider this factor for their personal improvement.

By quantitative analysis, it has been inferred that most of the chosen staff are less creative and innovative for which they have low values compared to the mean. Hence, the staff need to consider this factor to make personal improvement in knowledge. On the other hand, by secondary research, it has been understood that a person needs to have develop innovative skills and develop creativity to gain some knowledge through knowledge management systems.

Furthermore, the organisational attitude towards creativity and innovation needs to be understood. If the organisation does not encourage or facilitate the knowledge acquisition of the individual, then the employees will not tap into their innovative and creative potential.

Table 4.12: Creativity and Innovation Index results

Participants	Creativity & Innovation	IK-INDEX
P1	5.50	6.26
P2	5.50	5.20
P3	4.50	4.55
P4	3.88	5.12
P5	6.00	5.68
P6	4.38	5.16
P7	6.38	6.30
P8	6.30	4.94
P9	4.50	4.22
P10	6.25	6.60
P11	5.63	5.41
P12	4.00	4.61
P13	2.75	2.96
P14	6.38	4.72
P15	5.00	5.07
P16	5.00	5.00
P17	4.90	5.27

P18	5.80	4.53
P19	5.60	5.46
P20	5.00	4.56
P21	5.70	4.81
P22	5.88	5.47
P23	5.13	4.89
P24	4.80	4.69
P25	4.75	5.44
P26	4.50	4.84
Mean	**5.15**	**5.07**

Willingness to Share Coefficient

The mean value for willingness to share is 5.67. 14 employees have a high level of willingness to share as their corresponding values are higher than the mean. Out of these 14 employees, 8 employees have high IK index; and 5 have low IK index. As per these statistics, it is established that willingness to share does affect individual knowledge, but the effect is not that prominent.

Thus, it can be inferred that most of the chosen factors have a positive relationship with the individual knowledge or IK index and are positive when compared with the mean value. This shows that considering these factors, the employees can gain more knowledge and share it with the organisation as well to improve the level of knowledge. However, it has been analysed that IT literacy and education are negatively related and are not so important in terms of managing knowledge among the individual people.

Table 4.13: Creativity and Innovation Index results

Participants	Willingness To Share	IK-INDEX
P1	6.67	6.26
P2	5.33	5.20
P3	5.17	4.55
P4	4.92	5.12
P5	6.73	5.68
P6	6.00	5.16
P7	6.50	6.30
P8	6.00	4.94
P9	5.00	4.22
P10	7.00	6.60
P11	6.00	5.41
P12	4.00	4.61
P13	4.00	2.96
P14	5.75	4.72
P15	5.00	5.07
P16	5.00	5.00
P17	6.60	5.27
P18	6.00	4.53

P19	6.40	5.46
P20	6.50	4.56
P21	5.60	4.81
P22	6.00	5.47
P23	5.25	4.89
P24	5.80	4.69
P25	5.25	5.44
P26	5.00	4.84
Mean	**5.67**	**5.07**

It has been understood that in knowledge management, organisations face issues like making proper decisions or strategic planning, enhancing accountability, improving efficacies or improving teamwork (Zheng et al., 2010). Hence, knowledge management is an efficient function which offers proper strategies or strategic planning decisions, to deal with the identified issues and make accessing knowledge easier. Knowledge management or individual knowledge help in delivering appropriate decisions. Few strategic planning or strategic decisions need proper decision-making strengths for which individual people need to gather knowledge and enhance the decision-making process of the organisations (Dalkir & Liebowitz, 2011). It has been analysed that innovation and teamwork are converging with knowledge management and sharing. Teamwork and proper development of knowledge among the people in an organisation help in bringing innovation to the workplace (Sapsed et al., 2002). Teamwork helps in converting personal and tacit knowledge into organisational knowledge through which organisations can use to bring innovation into their workplace (Brown & Duguid, 2001). The innovative notions of the individuals are challenged, articulated, refined and then converted into innovative processes which consist of new processes, services or products.

Combining all of the above obtained results, Table 4.2 below depicts the IK Index results at the individual level for each of the parameters.

Table 4.14: IK Index results

Participants	Experience	Education	Training	IT Literacy	Business Communications	Business Process Interactions	Personal Network	Work Performance	Creativity & Innovation	Willingness to Share	IK-INDEX
P1	5.00	4.33	7.00	6.00	6.79	6.75	6.75	7.00	5.50	6.67	**6.26**
P2	5.00	3.00	6.33	5.00	5.21	5.00	4.50	6.00	5.50	5.33	**5.20**
P3	3.75	4.67	3.33	6.00	4.74	4.63	4.06	5.13	4.50	5.17	**4.55**
P4	6.00	3.67	6.00	6.50	4.93	4.56	4.50	5.75	3.88	4.92	**5.12**
P5	6.38	4.50	5.50	5.00	5.97	5.70	5.55	5.90	6.00	6.73	**5.68**
P6	5.00	4.00	3.00	4.00	5.81	4.56	5.94	6.75	4.38	6.00	**5.16**
P7	5.75	6.00	6.00	6.25	6.50	6.50	6.50	6.50	6.38	6.50	**6.30**
P8	3.19	3.58	2.83	4.50	5.46	4.00	5.25	6.60	6.30	6.00	**4.94**
P9	3.00	3.00	3.00	3.00	4.94	4.75	5.00	5.00	4.50	5.00	**4.22**
P10	7.00	7.00	6.33	4.50	6.73	6.31	6.63	7.00	6.25	7.00	**6.60**
P11	6.25	4.67	2.67	6.50	5.55	5.13	4.44	6.63	5.63	6.00	**5.41**
P12	6.00	4.67	1.00	5.00	4.44	3.25	4.00	6.50	4.00	4.00	**4.61**
P13	3.50	4.00	2.67	3.50	2.70	1.00	2.19	3.63	2.75	4.00	**2.96**

P14	3.75	5.67	2.67	6.00	4.28	1.75	2.88	6.75	6.38	5.75	**4.72**
P15	3.75	4.33	2.67	4.50	5.44	3.75	6.00	7.00	5.00	5.00	**5.07**
P16	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	**5.00**
P17	6.31	6.50	4.50	4.63	5.36	4.40	5.15	5.30	4.90	6.60	**5.27**
P18	4.25	4.00	2.50	3.13	4.84	3.60	3.75	6.00	5.80	6.00	**4.53**
P19	4.25	4.50	5.00	4.63	6.06	6.00	5.85	6.00	5.60	6.40	**5.46**
P20	4.06	4.50	4.00	4.63	4.72	2.00	4.63	5.75	5.00	6.50	**4.56**
P21	4.25	4.50	3.25	5.75	5.01	3.45	5.60	5.40	5.70	5.60	**4.81**
P22	6.00	4.67	4.67	4.00	5.73	5.44	5.63	5.88	5.88	6.00	**5.47**
P23	3.50	5.33	3.00	5.00	5.28	4.25	6.13	5.50	5.13	5.25	**4.89**
P24	3.81	4.08	1.75	4.13	5.53	4.80	5.80	5.70	4.80	5.80	**4.69**
P25	6.06	3.83	5.75	6.00	5.38	4.81	5.19	6.25	4.75	5.25	**5.44**
P26	6.75	3.08	5.58	6.00	4.44	3.00	4.25	5.50	4.50	5.00	**4.84**

From the above table, it can be understood that the highest scoring individual is Participant (P1) with a total score of 6.26. Furthermore, it can be seen that Participant (P1) scored the highest on Business Communications with a score of 6.79. Therefore, it can be seen that the MinK framework is allowing the researcher to point out the knowledge holder in the domain of business communications, for instance. In addition, Participant (P1)'s willingness to share is also high with a score of 6.67. This information can allow the organisation to solicit Participant (P1) to share their knowledge to others in regards to Business Communication, for instance. The MinK framework has been found to facilitate the pinpointing of a high knowledge holder; it also allows the identification of a low knowledge holder. For instance, Participant (P13) has the lowest score in Business Communications who can then be trained under Participant (P1) as the highest

knowledge holder to allow Participant (P13) to gain more knowledge in this area. Therefore, based on the MinK framework, the organization can identify high knowledge holders and low knowledge holders and pair them together so that the low knowledge holder can gain more knowledge. Furthermore, for people with a lower propensity to share knowledge, interventions can be set up to ensure that their perspective shifts so they can also share their knowledge to others in the organization. Therefore, this research has proven that the implementation of MinK is not only plausible, but can bring several benefits to the organization.

4.4. Conclusion

This chapter provided the results of the qualitative study and the IKI evaluation using MinK framework for the Public Relations Department of Saudi Aramco as cycle one of the action research spiral. The results indicate that the organisational culture promotes the use and transfer of knowledge, but does not have the tools to capture and identify knowledge bases in the employees. The organisational culture, as was noted from the interviews, was welcoming of new knowledge related interventions. Furthermore, the participants noted that they would be willing to apply MinK provided it was beneficial in the organization. Therefore, the researcher evaluated the applicability of MinK framework by carrying out a mock operationalization of the same. This is the first application of the framework and the first operational evaluation of its working. It was found that the framework effectively measures various aspects of an individual's knowledge in a robust manner.

The results of the MinK framework for the Public Relations department of Saudi Aramco indicate that work experience is the primary indicator and influencer of knowledge in the organisation, as are communication, creativity and innovation, personal network, business process interactions, work performance and willingness to share. Education and IT literacy did not have any influence in the knowledge index of the individual. This chapter has also discussed these results within the context and within the theoretical background.

Furthermore, and primarily, the results indicate that it is not only feasible but also beneficial for the organisation to implement MinK framework as it will help the organisation identify knowledge holders and train other employees who are lacking in a particular area. Moreover, implementation

of MinK will also allow the organization to launch apprenticeship programs to ensure that low knowledge holders are gaining the appropriate resources.

The following chapter will discuss the overall research that took place and provide the limitations that this study has. It will also provide recommendations for future researchers and for organisations to better use the results of this study in a practical context. This study has found there is a need for measuring knowledge using a universal framework in the organisation and that the MinK framework comprehensively measures individual knowledge across various areas and overall as well, thereby providing the much-needed framework. Once the MinK framework is used in practical settings, the measurement of knowledge and its subsequent management will be carried out in a strategic manner that is uniform across the organisation. In addition, with this, the research moves onto the second phase of the action research: testing the plausibility which is presented in the following chapter.

5. Testing the Feasibility of Implementing MinK Framework

5.1. Introduction

One focus group was conducted with 8 executive management team members from Saudi Aramco with the researcher serving as the moderator. The introductory session of the focus group involved the researcher outlining, in detail, the research that is being conducted and the usage of MinK framework. Using a presentation, the results of the MinK framework were presented to the executive management team. Following the presentation, each of the participants were provided with a written report documenting the result obtained from operationalising the MinK framework so that they may refer to the same during the discussion.

Each of the 8 participants were requested to provide information regarding what they thought was the benefit of using MinK in the organisation as well as the limitations that were associated with the same. The following chapter briefly discusses the result of the focus group.

5.2. Benefits of using the MinK Framework

5.2.1. MinK can serve as an ideal tool

There was a unanimous agreement between the participants regarding the application of the MinK framework. For instance, Participant 2 stated, “We have been trying to find an application that measures many different things in one and this seems to be the one so far. Like we have KPIs for employees and all that but they don’t measure the knowledge of the person in any given department”. In addition, Participant 5 outlined, “Yeah, exactly, I think that by measuring these different categories like creativity and innovation, and IT literacy, business communication, and all of these other categories will be beneficial for the organisation”.

In agreement, Participant 1 noted, “Yes, we don’t necessarily measure all these things together. We have measures for performance related outcomes using KPIs, like Participant 2 said, but we don’t have a measure for creativity and innovation, for example. No one would think to club together these different parameters. I think it will add value to the organisation”.

Participant 7 agreed and stated, “Also, I think that by measuring all these things together, we can get a full picture of the employees’ core competencies and how they are affecting their work. Such

full picture is currently missing. I think this is a wonderful thing to consider and potentially apply in the organisation".

One of the primary benefits that was outlined in the focus group discussion was that it combines various aspects together and brings together seemingly unrelated factors for presenting a comprehensive look into the knowledge index of an individual. In addition, participants also noted that with this kind of information, it is possible to move employees internally within the company to ensure that the low knowledge holders are working with the high knowledge holders to allow the former to enhance their knowledge index. For instance, Participant 6 outlined, "Yes, what others here have said applies well. I also think that there is another potential use for this kind of tool. I understand that high knowledge index means the person has a higher knowledge rating and vice versa. So if we can identify people who actually have low knowledge index and pair them with people with a higher knowledge index, we can enhance the knowledge sharing and make sure that the low knowledge employee is learning from the high knowledge employee".

Overall, all of the participants agreed with one another over the benefits of the MinK framework and envisioned it being applied in various aspects to generate a better organisational outcome. As has been discussed above, the participants outlined that MinK can allow them to ensure better employee appraisals are being carried out which provide the full picture of the competencies of the employees while also ensuring that through the identification of the knowledge holders, knowledge sharing can be better facilitated between employees.

5.2.2. Workability of MinK

When looking at the workability of the MinK framework, the participants noticed interesting trends and brought them forward during the discussion. For instance, one of the participants noted that there is an interesting dichotomy that was identified in the relationship between knowledge, education, and experience. In other words, the framework was inconclusive on the role that education played in enhancing the knowledge index while experience played a primary role in the same.

The differences in the results of the knowledge index related to education and experience were highlighted by Participant 6, who oversaw the human resources department in the organisation.

Noting that it was interesting to see that the educational background of the individual did not influence their knowledge index, Participant 6 stated that this will impact on the hiring policies that are in place in the company. In other words, Participant 6 highlighted, "This is very interesting. Normally you would think that having a higher degree is more beneficial, but it's not. This will influence our policies. Many times we have selected an employee with more high quality education but little experience over someone with low education but more experience. You know what I mean? Like choosing a candidate because they have master's degree with 2 years of experience over someone who has bachelors with 4 years of experience."

In addition, Participant 5, in agreement with Participant 6 stated that, "we could modify the framework a little bit and make this as a screening test for the candidates when they come for interviews. Especially for the technical jobs and such". When asked about the nature of changes that need to take place in the MinK framework for it to work as a screening test, the participants noted that this will need much deliberation and discussion which cannot be possible under current circumstances. There was unanimous agreement between the participants in regards to this.

Further analysis revealed that the participants noted the results of the link between training and the IKI. More specifically, it was noted that there is an influence of the quality of the training that is provided. Participant 1 outlined, "I can see that, one, training is not being provided extensively and two, even the ones who underwent training have low knowledge index. This means that either the training was not relevant or was not delivered properly. Either way, this provides us with more idea into what can be done in the future to correct this". There was unanimous agreement amongst the participants with regards to this.

In addition, Participant 2 outlined that for some time the organisation has been focused on making sure that all of the employees are provided with sufficient training to ensure that they can use the organisational systems and have IT capabilities. However, this does not translate into effective knowledge management. In other words, Participant 2 noted, "See here, it shows that IT literacy does not have any impact on the knowledge of the person. So why should we be spending so much money and time on the same?". However, Participant 4 corrected Participant 2 and noted, "Yeah, but that is not to say that the employees should not be taught how to use the system. I think we can

scale back the investment for that and use that for something else for example business communication as I can see that it greatly affects the knowledge index of the employee".

Overall, the participants agreed that there is a benefit in applying the MinK framework and that it works well. The participants agreed that the MinK framework provided them with several insights that were not so evident had they not participated in this research. In addition, participants outlined that MinK can allow them to focus their resources towards developing those capabilities that are positively related towards knowledge index.

Reminding the participants that the results only indicated the knowledge index of one department for the purposes of operationalising the MinK framework, the participants noted that other departments can provide different outcomes which can then allow them to customize their resource spending. For instance, Participant 8 said, "Yes, sure, it is only for one department now, but with that itself, it has provided so much information. We can do this across some of our other major departments and see what comes out. Then we can accordingly apply the relevant approaches to enhance the knowledge index".

As the participants agreed with positive benefits of the framework and stated that implementation of MinK framework has good potential to benefit the organisation, they also noted that the framework works well and is a comprehensive overall picture of the knowledge index. MinK can also allow them to make smarter decisions and ensure that there is sufficient resource allocation carried out appropriately. However, the participants also outlined several challenges in the application of MinK and their likely resolution.

5.3. Challenges of Implementing MinK in Saudi Aramco

Participant 8 stated that the MinK framework helps in identifying hidden issues between employees as significant discrepancies between appraisals ratings of the same individual often indicate that the inconsistent appraisal was influenced by external factors. In addition, Participant 2 also said, results show that the ratings from the employees' peers are significantly lower than himself/herself and their bosses' ratings. The participants believe that his/her low peer rating is influenced by competition between peers and that he/she deserves to be in a higher category. This can present significant challenges due to this being a 360 degree appraisal.

In addition, several participants stressed on the importance of proper appraiser selection to ensure the veracity of the assessment processes and recommended that peers should not be asked to assess each other if they have a competitive relationship, a factor they had overlooked when selecting appraisers.

When asked about factors that help to make the MinK framework usable by PRD and hopefully by all of Saudi Aramco's departments in the near future, Participant raised 8 two issues: The first is the competence of the consultant supporting MinK implementation, to asses managers who are unfamiliar with the MinK framework that will require guidance during the customisation phase of the assessment project and also in interpreting results in a meaningful and constructive manner. The consultant role is therefore critical to maximising the benefits the organisation gains out of this individual knowledge assessment exercise.

The second success factor the participant mentioned is the engagement of employees in the knowledge assessment project. Employees' eagerness to participate in knowledge assessment initiatives is believed to produce more useful results and shortens the time period allocated to data collection. The manager felt that more effort is required to change employee perception from viewing assessment exercises as an administrative burden to viewing them as a beneficial organisational practice. This can be achieved using awareness training to highlight the benefits of knowledge assessment. It is also important to assure employees that individuals who will score lower on the IK Index will not be penalised, but rather given time and training to improve.

Finally, Participant 6 indicated that an organisational structure type presentation would be a very useful aid to display results. He believes it helps to visualise knowledge-holders, supports managers in decision-making and helps managers to leverage knowledge stocks, drive its flows between different units of the organisation, and plan knowledge development training programs. Also, he has also recommended that the MinK framework should be institutionalised within the organisation and implemented periodically to elucidate the changes brought about by KM decisions taken by management.

In conclusion, despite the challenges that were outlined by the participants, the participants stated that the MinK framework can be applied in the organisation.

The executive management team has also recommended that the MinK framework should be institutionalised within the organisation and implemented periodically to elucidate the changes brought about by KM decisions taken by management.

This discussion thus advocated a KM approach through the MinK Framework for the Public Relations Department (PRD) in Saudi Aramco that places the individual knowledge holder at the core of KM activity and suggests that effective KM is essentially effective management of knowledge holders. Finally, the focus groups introduced the executive management team to the MinK framework and through a detailed discussion, the benefits and workability of the MinK framework were identified. With the implementation of MinK in the organisation, the challenges identified will be mitigated through a careful management process.

6 Research Conclusion & Suggestions to Practice

6.1 Conclusion

The primary aim of this research was to introduce a knowledge assessment mechanism to assess and pinpoint a knowledge holder and support decision making in knowledge management and allocation of knowledge resources (knowledge workers) in Saudi Aramco. The secondary aim of this research is also to identify the importance or the need for knowledge management in a public organisation. The choice of the study organisation was Saudi Aramco due to the fact that it is one of the largest public sector organisations in Saudi Arabia. In addition, Saudi Aramco is committed to cultivating and improving its knowledge sharing culture, processes, technology and people collaboration. Furthermore, a public sector organisation was chosen due to the fact that innovative practices that aim at better KM are not readily accepted in public sector organisations compared to private sector organisations due to the former being less focused on profitability.

The study adopted the knowledge-based view of the organisation with the epistemic assumption being that knowledge is possessed by individuals in the organisation. Considering that knowledge is the most important resource in the organisation, this research assumed that retaining that knowledge in the organisation is critical even if the individual possessing that knowledge was no longer associated with the organisation. It is critical as, being the most important resource in the organisation, knowledge needs to be managed and leveraged to allow the organisation to gain more competitive edge in the market. Adopting the knowledge-based view allowed the researcher to assume that an organisation can generate competitive advantage in the way it uses its resources or knowledge.

Organisational knowledge is one of the most important factors that leads to the generation of increasing returns for the organisation. In other words, knowledge is a resource that when consumed, leads to a greater value generation rather than reduction (as is the case when tangible resources are used up) and the relationship that exists between knowledge and competitive advantage is dependent on the organisation being able to apply and integrate the knowledge into its processes. Therefore, it was necessary to equip the organisation with tools that will enable it to develop into a knowledge based organisation.

As part of the process for identifying the MinK framework as the desired tool to be studied, the research briefly evaluated other tools available for knowledge management and assessment such as financial methods, IC Scorecard methods, Human Capital methods, and the Balanced Scorecard method. It was identified that none of the aforementioned methods provided a comprehensive insight into the location and extent of knowledge in the organisation. Furthermore, commonly used tools such as the Balanced Scorecard method did not allow for the measurement of the knowledge index of an employee. To account for this gap, researchers Ragab and Arisha (2014) developed the MinK framework which measured the knowledge index of an employee based on Nonaka and Takeuchi's (1995) SECI model. The MinK framework consists of parameters such as Education, Experience, Training, IT Literacy, Business Communication, Business Process Interactions, Personal Network, Performance, Creativity & Innovation, and Remuneration. Using these parameters, the MinK framework measures individual knowledge and helps in the identification of the knowledge stock in an individual for the organisation to use.

With the above knowledge, and to achieve the aim of this study, an action research approach was carried out in two stages: mapping the terrain and testing plausibility. Action research embedded in a pragmatic approach was the ideal choice of research method for this research due to its need to solve a multifaceted problem of effective knowledge management and identification of knowledge stock in an organisation. This research consisted of two cycles as noted above.

The first cycle, mapping the terrain was further comprised of two phases. Phase one consisted of 26 qualitative interviews which were conducted with the primary aim of identifying any current knowledge assessment mechanisms that might exist in the organisation. The sample selected were 26 employees at various levels of management in the Public Relations Department of the organisation. These interviews also allowed the researcher to understand the organisational dialogue with respect to knowledge management and the attitude towards implementation of a new framework. It was important to understand the organisation's culture and the organisational dialogue with respect to KM due to the fact that a KM system will fail if the organisation's culture does not actively support its success. In other words, successful KM in an organisation is driven by the presence of a strong organisational focus on the same which is then shared by employees in the organisation. It was found that the view in the organisation was that implicit or tacit knowledge is critical and more important than explicit knowledge. Due to this, the organisation places and enhanced importance on maintaining implicit knowledge in the organisation. Furthermore, it was

also identified that in the organisation, sharing implicit knowledge is critical and encouraged in the organisation. The interviews also highlighted the fact that KM enhances efficiency in the organisation. It was also noted that KM platforms are crucial in the organisation so that the learning curve of any new employees is shortened and less focus is placed on trial and error. Furthermore, it was also identified that the organisation focuses on ensuring that effective KM is carried out in the organisation by trying to establish KM platforms. With respect to the presence of an existing KM Framework in Saudi Aramco, it was discovered that while the organisation was trying to implement such a framework in the organisation, none of the attempts were successful. One of the reasons for the lack of success was that different departments were trying to conduct KM in different ways.

In addition, the interviews allowed the researcher to understand that the current dialogue with respect to KM system in the organisation was centred on the integration of knowledge dimensions into compensation and reward systems. However, several participants stated that knowledge transfer should not be incentivised and needs to be an essential part of the job description of an employee. However, there was a general consensus with regards to the type of incentives in that the incentives to be provided for knowledge sharing should not be financial. Finally, it was also identified that all of the participants accepted the implementation of the MinK framework as that would provide a comprehensive picture of the knowledge that an individual possesses. With this, the study moved onto phase two of the action research cycle one.

Phase two of mapping the terrain consisted of operationalising the MinK framework in the Public Relations Department to test and display its workability and applicability in Saudi Aramco. While the number of respondents was 26, due to this being a 360 degree measure, the amount of data generated was 104 (26 multiplied by four). This was because each of the respondent was being evaluated four times: self-report, peer-report, subordinate-report, and manager-report. This data that was collected was analysed using the MinK framework in a process outlined by Ragab and Arisha (2014).

The second cycle of this action research, testing the plausibility, was carried out with a focus group consisting of 8 members from the executive management team. During this stage, the researcher presented the results of the MinK framework that were obtained in phase two of mapping the terrain. From the focus group, it was identified that there were several benefits of applying the

MinK framework across the organisation and that the MinK framework provided an insight into an employee which was not obtained with other organisational methods before. Furthermore, it was also identified that the MinK framework provides an overall picture of the various parameters such as education, training, experience, IT knowledge, business communication, business process communications, individual network, performance, and innovation or creativity that influence the knowledge index of an employee. It was also identified that with the application of MinK, the organisation will be able to maximise knowledge sharing with careful, strategic planning. Therefore, through MinK, the executives and senior managers of the organisation are provided with a valuable tool capable of identifying knowledge holders and supporting effective KM decision making to achieve optimal organisational performance. Results showed that the MinK framework is very much accepted by the executive management team of Saudi Aramco as a valid framework for assessing and managing knowledge.

This research has, in conclusion, furthered the research in the area of knowledge management and provided actionable knowledge that can be adopted by the organisation as part of their knowledge assessment initiatives. In other words, this research has generated actionable local knowledge that is situational and contextual. Generalisability across the research area is not possible due to this not being a Mode 1 research which is generally context free and follows a universal law. In this research, however, the knowledge produced and the theory generated is situational and transient, with the research being an immersed part of the research and an agent of change.

6.2 Action Plan

For the implementation of MinK in the organisation, the following action plan has been proposed.

Table 6.1: Action Plan

Action Plan	
First Quarter of 2020	Successful implementation in the PRD of Saudi Aramco

Second Quarter of 2020	Display of results from the PRD as a way of MinK induction for organisation to buy in
Third Quarter of 2020	Implementation of MinK across various departments
Fourth Quarter of 2020	Management of resistance to change and organisation-wide implementation of MinK

. The research study is only conducted in one department (PRD) as a prototype of trying to introduce and implement the MinK framework as a tool to measure individual knowledge in the said department; however, upon the success of the prototype on PRD, the framework will be introduced and hopefully implemented in the entire departments of Saudi Aramco.

6.3 Recommendations

6.3.1 Theoretical Recommendations

Future research can adopt the action research methodology and carry out the implementation of the knowledge assessment framework in the organisation of choice with three stages. In other words, future studies can lend more depth to their analysis by evaluating the implementation of the adopted framework. While the feasibility evaluation of implementing the MinK framework in a public sector organisation was carried out in this research, the challenges associated with the actual implementation process were not considered. Future research can hence look into this and conduct similar research with the consideration of the challenges associated with organisational change in the knowledge management sphere. Future research can also conduct further investigation into the applicability of the MinK framework. Research in the future must also conduct a larger study with a much wider sample size that spans a few departments at least, if not the entire organisation.

The research on the development and implementation of knowledge assessment models is well-developed. While there are several models that exist, none of the models allow for the pinpointing of a knowledge holder which is essential if tacit knowledge is to be extracted and converted to explicit knowledge to be maintained in the organisation. Future research can adopt a similar perspective and further the research on identifying knowledge workers in an organisation.

6.3.2 Practical Recommendations

Saudi Aramco can apply the MinK framework across the organisation in order to ensure that there is a uniform knowledge assessment framework. One of the limitations identified during the focus group was that, due to the 360 degree nature of the appraisal, employees competing against one another may provide biased ratings. In addition, this bias can also appear in the interaction between managers and employees which can thus result in a low rating for an otherwise high knowledge holder, for instance. To counteract this issue, the organisation needs to appoint an external appraiser for each of the departments who interacts with the department on a daily basis, but does not have the scope to compete with the employees or is the least affected by the bias. Furthermore, the organisation needs to develop an implementation plan which manages the change in resistance of the employees which will occur during organisational change. Moreover, external organisations can learn from this research and implement a knowledge assessment and management framework based on the insights gained from this research.

6.4 Limitations of the Research

One of the primary limitations of this study is that it was only focused on one department within the organisation due to limited time and resources. Therefore, the generalisability of the research outside the organisation is limited. Another limitation of the study is a small sample size used in this research.

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Appendices

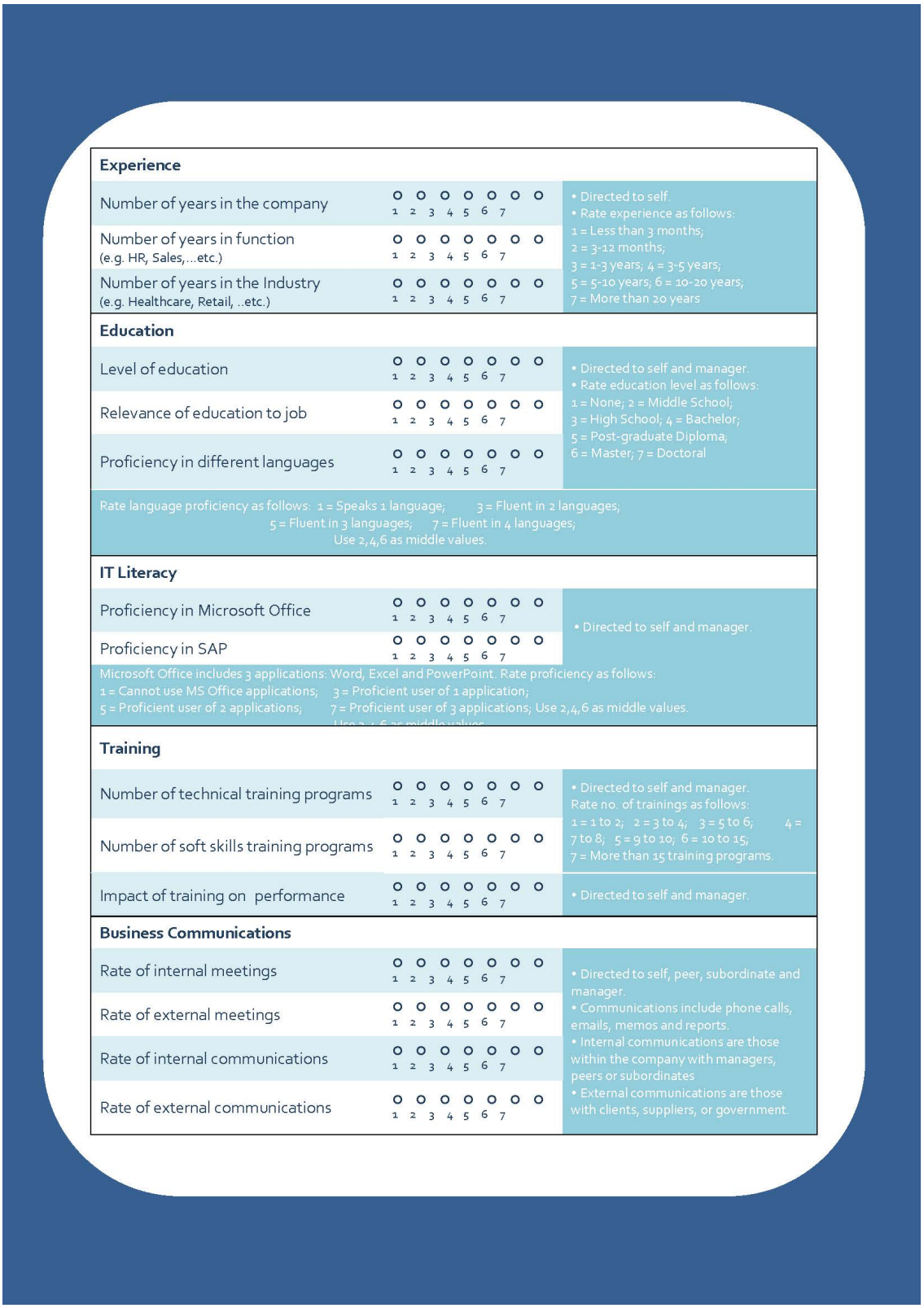
Appendix A – Sample Coding Table

Implicit Knowledge is more important	Sharing Implicit Knowledge is important	Knowledge management ehances efficiency	Knowledge management platforms are necessary
why I think so is that there are different areas of knowledge either that people come to a big company with and that they acquire why there here. And so for our company what's really important is that people that develop knowledge about how our company works is immensely important. And our projects that you work on The more experience that you get in navigating , you know how to get things done in the most efficient way you establish contacts, you understand cultural differences in most organisations, learning how to go between those and how to get your work done. And so that's a level of institutional knowledge that people gain while they here and I think when they leave here so I think that you can encapsulate that somehow, to somebody so they didn't have to go through the trial and error so that would speed up efficiency (P1)	we employ a wealth of experienced staff globally and those ex patriates will eventually move on and oftne without any formal opportunity to hand over their practical experience Or the case stuides or project experience to those with less experience. (P4)	The more experience that you get in navigating, you know how to get things done in the most efficient way you establish contacts, you understand cultural differences in most organisations, learning how to go between those and how to get your work done. And so that's a level of institutional knowledge that people gain while they are here. (P1)	Our company is different than the rest so even just being able to work here for an employee has happened due to knowledge transfer and knowledge management on behalf of the team that they work in. Even if the person comes from a similar company, still they have to undergo a learning curve. That is facilitated by the company. (P2)
very important eh knowledge management because this type of job that we do here corodinating the corporate exhiibits nationally and internationally is knowledge based process that requires a lot experience and a lot of knowledge because it is a type of event management of corodination it is important (P5)	I think corporation should play a much bigger role in making sure that knowledge is spread out among the employees (P3)	"Yes, it is crucial especially because we are constantly trying out new things and bringing in new business activities, so to ensure that there is efficiency, we need to have people who are capable of doing the work." (P11)	I think corporation should play a much bigger role in making sure that knowledge is spread out among the employees and nowadays there are a lot of platforms; there has to be some knowledge platforms that helps employees to share knowledge right now (P3)
there is a lot of very specific tasks that are involved my job is very different than other peoples jobs so not only is it important for me to know all those little things that are involved multi business lines not dealing with business lines but internally is well having to go up on our line for approval and also just in general as well as there the key things (P6)	helps employees to share knowledge among them and this is very very important and this not only relies on the company only but also take the initutives and try to reach out to colleagues but sharing is very important nowadays sharing is very important (P3)	I think there is a wealth of experience and we have a number of young employees that have joined us, and so I think that there is very important to have these kind of programmes to make sure that we are transferring the knowledge to our young staff, this will help a lot in minimising our operation time." (P17)	this type of job that we do here coordinates the corporate exhibits nationally and internationally. It is a knowledge-based process that requires a lot experience and a lot of knowledge because it is a type of event management where coordination is learnt through experience." (P5)

	someone works for ten years in that company the work that they did was for the copnay was for that company so ina certain way the knowlledge that they did it technical knowledge, operational knowldedge ,strategic knowledge , it's people knwoledge it's cultural knowledge it company property it's company interllectual knowledge. All these different types of inforamtion that they get in the course of their time here really in my mind is company property it's their responsiblilty to reap the benefit that they got.to make sure of the knowledge that they got. (P1)	It will allow us to get more access to information by using sharing platforms like Google Docs and others to collaborate and generate efficiency (P22)	I mean there are a lot of very specific tasks that are involved. My job is very different than other people's jobs, so not only is it important for me to know all those little things that are involved multi business lines, but also be aware of what is happening in the bigger picture (P6)
	it 's really important we do weekly reports that go out for certain things or whatever someone like a key position holder or someone In the highly technical position that may be hide and that the notes need to be sent out .So other will be aware of it people share that so you get these reports sometimes going to high management internally of the primary.	It will lead us to become a more structured organisation as a whole and allow us to exploit the localised knowledge that is available." (P22)	It is important to teach your subordinates what they need to do for managing the operations in your absence (P6)
		Yes, I believe it will increase the productivity of the work force. Knowledge is crucial and is often undocumented. Which means that even though knowledge exists, we don't access it most of the time. Imagine how many man-hours we will save if we have a good knowledge management system (P25)	Without knowledge management or proper management there is no proper knowledge (P10)
		it will help our staff make fewer mistakes (P26)	organisations are living breathing things and over time knowledge is passed on from through an organisation so it can continue to progress and reach its goals." (P14)
			it is important to generate and retain knowledge in an organisation." (P16)
			it is important to create the awareness of the company procedures in the organisation so that we have work done that is according to the operations (P19)
			the older people will leave the company and the young need to function in the absence of the old. So that's why knowledge management is important to keep the information in the company and come up with new things." (P20)

			There is a criticality that happens when information is not transformed properly from one to another. That sort of disconnect has to be avoided if the company has to function properly (P21)

Appendix B – MinK Questionnaire



Experience		
Number of years in the company	O O O O O O O 1 2 3 4 5 6 7	• Directed to self. • Rate experience as follows: 1 = Less than 3 months; 2 = 3-12 months; 3 = 1-3 years; 4 = 3-5 years; 5 = 5-10 years; 6 = 10-20 years; 7 = More than 20 years
Number of years in function (e.g. HR, Sales,...etc.)	O O O O O O O 1 2 3 4 5 6 7	
Number of years in the Industry (e.g. Healthcare, Retail, ..etc.)	O O O O O O O 1 2 3 4 5 6 7	
Education		
Level of education	O O O O O O O 1 2 3 4 5 6 7	• Directed to self and manager. • Rate education level as follows: 1 = None; 2 = Middle School; 3 = High School; 4 = Bachelor; 5 = Post-graduate Diploma; 6 = Master; 7 = Doctoral
Relevance of education to job	O O O O O O O 1 2 3 4 5 6 7	
Proficiency in different languages	O O O O O O O 1 2 3 4 5 6 7	
Rate language proficiency as follows: 1 = Speaks 1 language; 3 = Fluent in 2 languages; 5 = Fluent in 3 languages; 7 = Fluent in 4 languages; Use 2,4,6 as middle values.		
IT Literacy		
Proficiency in Microsoft Office	O O O O O O O 1 2 3 4 5 6 7	• Directed to self and manager.
Proficiency in SAP	O O O O O O O 1 2 3 4 5 6 7	
Microsoft Office includes 3 applications: Word, Excel and PowerPoint. Rate proficiency as follows: 1 = Cannot use MS Office applications; 3 = Proficient user of 1 application; 5 = Proficient user of 2 applications; 7 = Proficient user of 3 applications; Use 2,4,6 as middle values.		
Training		
Number of technical training programs	O O O O O O O 1 2 3 4 5 6 7	• Directed to self and manager. Rate no. of trainings as follows: 1 = 1 to 2; 2 = 3 to 4; 3 = 5 to 6; 4 = 7 to 8; 5 = 9 to 10; 6 = 10 to 15; 7 = More than 15 training programs.
Number of soft skills training programs	O O O O O O O 1 2 3 4 5 6 7	
Impact of training on performance	O O O O O O O 1 2 3 4 5 6 7	• Directed to self and manager.
Business Communications		
Rate of internal meetings	O O O O O O O 1 2 3 4 5 6 7	• Directed to self, peer, subordinate and manager. • Communications include phone calls, emails, memos and reports. • Internal communications are those within the company with managers, peers or subordinates • External communications are those with clients, suppliers, or government.
Rate of external meetings	O O O O O O O 1 2 3 4 5 6 7	
Rate of internal communications	O O O O O O O 1 2 3 4 5 6 7	
Rate of external communications	O O O O O O O 1 2 3 4 5 6 7	

Business Process Interactions		
Number of processes utilised	o o o o o o o 1 2 3 4 5 6 7	• A business process is a formal procedure of tasks to do a work activity e.g. Tender Process, Direct Purchase, Stock Request, Sample Request, Return of Good process,...etc.
Competence in using business processes and procedures	o o o o o o o 1 2 3 4 5 6 7	
• Directed to self, peer, subordinate and manager.		
Personal Network		
Extent of contacts within the company	o o o o o o o 1 2 3 4 5 6 7	• Directed to self, peer, subordinate and manager. • Contact Acquisition Rate refers to an individual's ability to make new business contacts and build their network.
Extent of contacts external to the company	o o o o o o o 1 2 3 4 5 6 7	
Relevance of contacts to business	o o o o o o o 1 2 3 4 5 6 7	
Contact acquisition rate	o o o o o o o 1 2 3 4 5 6 7	
Work Performance		
Problem-solving ability	o o o o o o o 1 2 3 4 5 6 7	• Directed to self, peer, subordinate and manager.
Performance Appraisal	o o o o o o o 1 2 3 4 5 6 7	
Creativity & Innovation		
Rate of new ideas suggested	o o o o o o o 1 2 3 4 5 6 7	• Directed to self, peer, subordinate and manager.
Rate of new ideas implemented	o o o o o o o 1 2 3 4 5 6 7	
Market Value		
Salary Scale	o o o o o o o 1 2 3 4 5 6 7	• Directed to manager only. • Rating scheme will depend on salary system and organisational tier structure (no. of job levels) and has to be set prior to the assessment.
Job Tier	o o o o o o o 1 2 3 4 5 6 7	
Willingness		
Willingness/motivation so share knowledge with others	o o o o o o o 1 2 3 4 5 6 7	• Directed to self, peer, subordinate and manager.
Motivation to develop knowledge and learn new things	o o o o o o o 1 2 3 4 5 6 7	
Company's encouragement and recognition of knowledge sharing	o o o o o o o 1 2 3 4 5 6 7	
General		
Overall individual knowledge rating	o o o o o o o 1 2 3 4 5 6 7	• A general overall evaluation of the person's knowledge. • Directed to self, peer, subordinate and manager.

Appendix C – Raw Data of MinK

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ID#	129
Name:	C
Job Title:	Manager
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	2				2
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	4				4
02 Education	1. Level of Education	4				4
	2. Proficiency in different languages	3				3
	3. Relevance of Education to Job	6				6
03 Training	1. Number of technical training courses	7				7
	2. Number of soft skills training programs	7				7
	3. Impact of training on performance	7				7
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7				7
	Proficiency in SAP	5				5
06 Business Process Interactions	1. Number of business processes used	7				7
	2. Competence in using business processes and procedures	7				7
	Involvement in business process design	6				6
	Involvement in business process improvement	7				7
07 Personal Network	1. Extent of contacts within the company	7				7
	2. Extent of contacts external to the company	7				7
	3. Relevance of contacts to job	7				7
	4. Contact acquisition rate	6				6
08 Work Performance	1. Performance at work	7				7
	2. Problem-solving ability	7				7
09 Creativity & Innovation	1. Rate of new ideas suggested	6				6
	2. Rate of new ideas applied / implemented	5				5
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	6				6
11 Willingness	1. Willingness/motivation to share knowledge with others	7				7
	2. Motivation to develop knowledge and learn new things	6				6
	3. Company's encouragement and recognition of knowledge sharing	7				7

ID#	130
Name:	J
Job Title:	Relations Director
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	1				1
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	5				5
02 Education	1. Level of Education	6				6
	2. Proficiency in different languages	2				2
	3. Relevance of Education to Job	1				1
03 Training	1. Number of technical training courses	7				7
	2. Number of soft skills training programs	6				6
	3. Impact of training on performance	6				6
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5				5
	Proficiency in SAP	5				5
06 Business Process Interactions	1. Number of business processes used	4				4
	2. Competence in using business processes and procedures	5				5
	Involvement in business process design	6				6
	Involvement in business process improvement	5				5
07 Personal Network	1. Extent of contacts within the company	5				5
	2. Extent of contacts external to the company	5				5
	3. Relevance of contacts to job	4				4
	4. Contact acquisition rate	4				4
08 Work Performance	1. Performance at work	6				6
	2. Problem-solving ability	6				6
09 Creativity & Innovation	1. Rate of new ideas suggested	6				6
	2. Rate of new ideas applied / implemented	5				5
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	5				5
11 Willingness	1. Willingness/motivation to share knowledge with others	5				5
	2. Motivation to develop knowledge and learn new things	5				5
	3. Company's encouragement and recognition of knowledge sharing	6				6

ID#	131
Name:	W
Job Title:	Admin Assistant
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	2				2
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	3				3
	3. Number of years in the industry	4				4
	4. Relevance of experience to current job	6				6
02 Education	1. Level of Education	6				6
	2. Proficiency in different languages	3				3
	3. Relevance of Education to Job	5				5
03 Training	1. Number of technical training courses	2				2
	2. Number of soft skills training programs	2				2
	3. Impact of training on performance	6				6
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7				7
	Proficiency in SAP	5				5
06 Business Process Interactions	1. Number of business processes used	6	4			10
	2. Competence in using business processes and procedures	6	4			10
	Involvement in business process design	4	3			7
	Involvement in business process improvement	4	3			7
07 Personal Network	1. Extent of contacts within the company	3	3			6
	2. Extent of contacts external to the company	4	2			6
	3. Relevance of contacts to job	6	3			9
	4. Contact acquisition rate	5	3			8
08 Work Performance	1. Performance at work	6	4			10
	2. Problem-solving ability	5	4			9
09 Creativity & Innovation	1. Rate of new ideas suggested	6	3			9
	2. Rate of new ideas applied / implemented	4	3			7
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	5	5			10
11 Willingness	1. Willingness/motivation to share knowledge with others	6	4			10
	2. Motivation to develop knowledge and learn new things	6	5			11
	3. Company's encouragement and recognition of knowledge sharing	4	5			9

ID#	132
Name:	L
Job Title:	Asst Public Rels Rep
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	6				6
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	6				6
	3. Number of years in the industry	6				6
	4. Relevance of experience to current job	6				6
02 Education	1. Level of Education	4				4
	2. Proficiency in different languages	2				2
	3. Relevance of Education to Job	5				5
03 Training	1. Number of technical training courses	6				6
	2. Number of soft skills training programs	6				6
	3. Impact of training on performance	6				6
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7				7
	Proficiency in SAP	6				6
06 Business Process Interactions	1. Number of business processes used	6	7			13
	2. Competence in using business processes and procedures	6	7			13
	Involvement in business process design	4	2			6
	Involvement in business process improvement	2	3			5
07 Personal Network	1. Extent of contacts within the company	5	6			11
	2. Extent of contacts external to the company	3	5			8
	3. Relevance of contacts to job	5	5			10
	4. Contact acquisition rate	4	5			9
08 Work Performance	1. Performance at work	6	7			13
	2. Problem-solving ability	5	6			11
09 Creativity & Innovation	1. Rate of new ideas suggested	4	5			9
	2. Rate of new ideas applied / implemented	3	5			8
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	5	6			11
11 Willingness	1. Willingness/motivation to share knowledge with others	3	7			10
	2. Motivation to develop knowledge and learn new things	5	6			11
	3. Company's encouragement and recognition of knowledge sharing	5	7			12

ID#	133
Name:	D
Job Title:	Media Rel Spec I
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	6				6
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	6		6		12
02 Education	1. Level of Education	6		5		11
	2. Proficiency in different languages	3		2		5
	3. Relevance of Education to Job	5		5		10
03 Training	1. Number of technical training courses	5		6		11
	2. Number of soft skills training programs	5		6		11
	3. Impact of training on performance	6		6		12
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5		5		10
	Proficiency in SAP	5		5		10
06 Business Process Interactions	1. Number of business processes used	5	7	6		18
	2. Competence in using business processes and procedures	6	7	6		19
	Involvement in business process design	5	6	6		17
	Involvement in business process improvement	5	7	6		18
07 Personal Network	1. Extent of contacts within the company	6	6	7		19
	2. Extent of contacts external to the company	4	5	6		15
	3. Relevance of contacts to job	6	7	6		19
	4. Contact acquisition rate	5	5	6		16
08 Work Performance	1. Performance at work	5	7	6		18
	2. Problem-solving ability	6	7	6		19
09 Creativity & Innovation	1. Rate of new ideas suggested	6	6	6		18
	2. Rate of new ideas applied / implemented	6	6	6		18
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating	6	7	6		19
11 Willingness	1. Willingness/motivation to share knowledge with others	7	7	6		20
	2. Motivation to develop knowledge and learn new things	7	7	6		20
	3. Company's encouragement and recognition of knowledge sharing	7	6	6		19

ID#	134
Name:	K
Job Title:	Media Rels Spec II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	3				3
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	7				7
	3. Number of years in the industry	3				3
	4. Relevance of experience to current job	7				7
02 Education	1. Level of Education	4				4
	2. Proficiency in different languages	1				1
	3. Relevance of Education to Job	7				7
03 Training	1. Number of technical training courses	2				2
	2. Number of soft skills training programs	2				2
	3. Impact of training on performance	5				5
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5				5
	Proficiency in SAP	3				3
06 Business Process Interactions	1. Number of business processes used	1	5			6
	2. Competence in using business processes and procedures	5	6			11
	Involvement in business process design	5	5			10
	Involvement in business process improvement	6	6			12
07 Personal Network	1. Extent of contacts within the company	4	6			10
	2. Extent of contacts external to the company	7	5			12
	3. Relevance of contacts to job	6	6			12
	4. Contact acquisition rate	7	6			13
08 Work Performance	1. Performance at work	7	6			13
	2. Problem-solving ability	7	6			13
09 Creativity & Innovation	1. Rate of new ideas suggested	4	6			10
	2. Rate of new ideas applied / implemented	4	5			9
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	6	6			12
11 Willingness	1. Willingness/motivation to share knowledge with others	7	6			13
	2. Motivation to develop knowledge and learn new things	5	6			11
	3. Company's encouragement and recognition of knowledge sharing	5	6			11

ID#	135
Name:	B
Job Title:	Supervisor
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	7				7
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	7		2		9
02 Education	1. Level of Education	7		4		11
	2. Proficiency in different languages	7		2		9
	3. Relevance of Education to Job	7		3		10
03 Training	1. Number of technical training courses	7		2		9
	2. Number of soft skills training programs	7		3		10
	3. Impact of training on performance	7		4		11
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7		4		11
	Proficiency in SAP	7		4		11
06 Business Process Interactions	1. Number of business processes used	7		5		12
	2. Competence in using business processes and procedures	7		5		12
	Involvement in business process design	7		5		12
	Involvement in business process improvement	7		5		12
07 Personal Network	1. Extent of contacts within the company	7		5		12
	2. Extent of contacts external to the company	7		5		12
	3. Relevance of contacts to job	7		5		12
	4. Contact acquisition rate	7		5		12
08 Work Performance	1. Performance at work	7		5		12
	2. Problem-solving ability	7		5		12
09 Creativity & Innovation	1. Rate of new ideas suggested	7		5		12
	2. Rate of new ideas applied / implemented	7		4		11
10 Market Value	Job Tier			4		4
	Salary Scale			4		4
12 Overall	Overall individual knowledge rating	7		5		12
11 Willingness	1. Willingness/motivation to share knowledge with others	7		5		12
	2. Motivation to develop knowledge and learn new things	7		5		12
	3. Company's encouragement and recognition of knowledge sharing	7		5		12

ID#	136
Name:	O
Job Title:	Business Analyist IV
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	3				3
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	3				3
	3. Number of years in the industry	3				3
	4. Relevance of experience to current job	4		3		7
02 Education	1. Level of Education	4		4		8
	2. Proficiency in different languages	3		2		5
	3. Relevance of Education to Job	4		4		8
03 Training	1. Number of technical training courses	2		3		5
	2. Number of soft skills training programs	2		3		5
	3. Impact of training on performance	4		4		8
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7		3		10
	Proficiency in SAP	3		3		6
06 Business Process Interactions	1. Number of business processes used	3	7	4		14
	2. Competence in using business processes and procedures	3	7	4		14
	Involvement in business process design	3	7	4		14
	Involvement in business process improvement	3	7	4		14
07 Personal Network	1. Extent of contacts within the company	5	7	5		17
	2. Extent of contacts external to the company	5	7	5		17
	3. Relevance of contacts to job	5	7	5		17
	4. Contact acquisition rate	4	7	5		16
08 Work Performance	1. Performance at work	7	7	5		19
	2. Problem-solving ability	7	7	5		19
09 Creativity & Innovation	1. Rate of new ideas suggested	7	7	5		19
	2. Rate of new ideas applied / implemented	6	7	5		18
10 Market Value	Job Tier			4		4
	Salary Scale			4		4
12 Overall	Overall individual knowledge rating	6	7	5		18
11 Willingness	1. Willingness/motivation to share knowledge with others	7	7	5		19
	2. Motivation to develop knowledge and learn new things	7	7	5		19
	3. Company's encouragement and recognition of knowledge sharing	5	7	5		17

ID#	137
Name:	Y
Job Title:	Supervisor
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company					0
	2. Number of years in the function (e.g. Sales, HR, ...etc.)					0
	3. Number of years in the industry					0
	4. Relevance of experience to current job			3		3
02 Education	1. Level of Education			4		4
	2. Proficiency in different languages			1		1
	3. Relevance of Education to Job			4		4
03 Training	1. Number of technical training courses			2		2
	2. Number of soft skills training programs			3		3
	3. Impact of training on performance			4		4
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)			3		3
	Proficiency in SAP			3		3
06 Business Process Interactions	1. Number of business processes used		5	5		10
	2. Competence in using business processes and procedures		5	5		10
	Involvement in business process design		5	4		9
	Involvement in business process improvement		5	4		9
07 Personal Network	1. Extent of contacts within the company		5	5		10
	2. Extent of contacts external to the company		5	5		10
	3. Relevance of contacts to job		5	5		10
	4. Contact acquisition rate		5	5		10
08 Work Performance	1. Performance at work		5	5		10
	2. Problem-solving ability		5	5		10
09 Creativity & Innovation	1. Rate of new ideas suggested		5	4		9
	2. Rate of new ideas applied / implemented		5	4		9
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating		5	5		10
11 Willingness	1. Willingness/motivation to share knowledge with others		5	5		10
	2. Motivation to develop knowledge and learn new things		5	5		10
	3. Company's encouragement and recognition of knowledge sharing		5	5		10

ID#	139
Name:	A
Job Title:	Writer Editor I
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	7				7
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	7				7
02 Education	1. Level of Education	7				7
	2. Proficiency in different languages	7				7
	3. Relevance of Education to Job	7				7
03 Training	1. Number of technical training courses	6				6
	2. Number of soft skills training programs	6				6
	3. Impact of training on performance	7				7
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	6				6
	Proficiency in SAP	3				3
06 Business Process Interactions	1. Number of business processes used	7	5			12
	2. Competence in using business processes and procedures	6	7			13
	Involvement in business process design	6	7			13
	Involvement in business process improvement	6	7			13
07 Personal Network	1. Extent of contacts within the company	7	7			14
	2. Extent of contacts external to the company	5	7			12
	3. Relevance of contacts to job	7	7			14
	4. Contact acquisition rate	7	7			14
08 Work Performance	1. Performance at work	7	7			14
	2. Problem-solving ability	7	7			14
09 Creativity & Innovation	1. Rate of new ideas suggested	6	7			13
	2. Rate of new ideas applied / implemented	6	7			13
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	7	7			14
11 Willingness	1. Willingness/motivation to share knowledge with others	7	7			14
	2. Motivation to develop knowledge and learn new things	7	7			14
	3. Company's encouragement and recognition of knowledge sharing	7	7			14

ID#	140
Name:	H
Job Title:	Writer Editor II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	4				4
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	7				7
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	7				7
02 Education	1. Level of Education	6				6
	2. Proficiency in different languages	1				1
	3. Relevance of Education to Job	7				7
03 Training	1. Number of technical training courses	1				1
	2. Number of soft skills training programs	1				1
	3. Impact of training on performance	6				6
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7				7
	Proficiency in SAP	6				6
06 Business Process Interactions	1. Number of business processes used	1	7			8
	2. Competence in using business processes and procedures	7	7			14
	Involvement in business process design	5	5			10
	Involvement in business process improvement	6	6			12
07 Personal Network	1. Extent of contacts within the company	5	5			10
	2. Extent of contacts external to the company	4	4			8
	3. Relevance of contacts to job	5	4			9
	4. Contact acquisition rate	4	4			8
08 Work Performance	1. Performance at work	6	7			13
	2. Problem-solving ability	7	7			14
09 Creativity & Innovation	1. Rate of new ideas suggested	5	6			11
	2. Rate of new ideas applied / implemented	6	6			12
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	6	6			12
11 Willingness	1. Willingness/motivation to share knowledge with others	6	6			12
	2. Motivation to develop knowledge and learn new things	7	6			13
	3. Company's encouragement and recognition of knowledge sharing	3	5			8

ID#	141
Name:	U
Job Title:	Public Rels Rep II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	6				6
	3. Number of years in the industry	5				5
	4. Relevance of experience to current job	6				6
02 Education	1. Level of Education	4				4
	2. Proficiency in different languages	3				3
	3. Relevance of Education to Job	7				7
03 Training	1. Number of technical training courses	1				1
	2. Number of soft skills training programs	1				1
	3. Impact of training on performance	1				1
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5				5
	Proficiency in SAP	5				5
06 Business Process Interactions	1. Number of business processes used	2				2
	2. Competence in using business processes and procedures	4				4
	Involvement in business process design	3				3
	Involvement in business process improvement	4				4
07 Personal Network	1. Extent of contacts within the company	5				5
	2. Extent of contacts external to the company	2				2
	3. Relevance of contacts to job	5				5
	4. Contact acquisition rate	4				4
08 Work Performance	1. Performance at work	6				6
	2. Problem-solving ability	7				7
09 Creativity & Innovation	1. Rate of new ideas suggested	4				4
	2. Rate of new ideas applied / implemented	4				4
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	4				4
11 Willingness	1. Willingness/motivation to share knowledge with others	4				4
	2. Motivation to develop knowledge and learn new things	5				5
	3. Company's encouragement and recognition of knowledge sharing	4				4

ID#	143
Name:	S
Job Title:	Public Rels Rep II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	3				3
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	3				3
	3. Number of years in the industry	3				3
	4. Relevance of experience to current job	6				6
02 Education	1. Level of Education	6				6
	2. Proficiency in different languages	5				5
	3. Relevance of Education to Job	6				6
03 Training	1. Number of technical training courses	3				3
	2. Number of soft skills training programs	1				1
	3. Impact of training on performance	4				4
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7				7
	Proficiency in SAP	5				5
06 Business Process Interactions	1. Number of business processes used	1	4			5
	2. Competence in using business processes and procedures	1	4			5
	Involvement in business process design	1	4			5
	Involvement in business process improvement	1	4			5
07 Personal Network	1. Extent of contacts within the company	3	4			7
	2. Extent of contacts external to the company	2	4			6
	3. Relevance of contacts to job	2	4			6
	4. Contact acquisition rate	3	4			7
08 Work Performance	1. Performance at work	7	6			13
	2. Problem-solving ability	7	6			13
09 Creativity & Innovation	1. Rate of new ideas suggested	7	6			13
	2. Rate of new ideas applied / implemented	6	6			12
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	6	5			11
11 Willingness	1. Willingness/motivation to share knowledge with others	7	6			13
	2. Motivation to develop knowledge and learn new things	7	6			13
	3. Company's encouragement and recognition of knowledge sharing	7	1			8

ID#	144
Name:	M
Job Title:	Public Rels Rep II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	5				5
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	2				2
	3. Number of years in the industry	5				5
	4. Relevance of experience to current job	3				3
02 Education	1. Level of Education	4				4
	2. Proficiency in different languages	5				5
	3. Relevance of Education to Job	4				4
03 Training	1. Number of technical training courses	2				2
	2. Number of soft skills training programs	1				1
	3. Impact of training on performance	5				5
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5				5
	Proficiency in SAP	4				4
06 Business Process Interactions	1. Number of business processes used	4				4
	2. Competence in using business processes and procedures	4				4
	Involvement in business process design	3				3
	Involvement in business process improvement	4				4
07 Personal Network	1. Extent of contacts within the company	7				7
	2. Extent of contacts external to the company	6				6
	3. Relevance of contacts to job	6				6
	4. Contact acquisition rate	5				5
08 Work Performance	1. Performance at work	7				7
	2. Problem-solving ability	7				7
09 Creativity & Innovation	1. Rate of new ideas suggested	6				6
	2. Rate of new ideas applied / implemented	4				4
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	5				5
11 Willingness	1. Willingness/motivation to share knowledge with others	7				7
	2. Motivation to develop knowledge and learn new things	7				7
	3. Company's encouragement and recognition of knowledge sharing	5				5

ID#	145
Name:	N
Job Title:	Supervisor
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	5				5
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	5				5
	3. Number of years in the industry	5				5
	4. Relevance of experience to current job	5				5
02 Education	1. Level of Education	5				5
	2. Proficiency in different languages	5				5
	3. Relevance of Education to Job	5				5
03 Training	1. Number of technical training courses	5				5
	2. Number of soft skills training programs	5				5
	3. Impact of training on performance	5				5
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5				5
	Proficiency in SAP	5				5
06 Business Process Interactions	1. Number of business processes used	5				5
	2. Competence in using business processes and procedures	5				5
	Involvement in business process design	5				5
	Involvement in business process improvement	5				5
07 Personal Network	1. Extent of contacts within the company	5				5
	2. Extent of contacts external to the company	5				5
	3. Relevance of contacts to job	5				5
	4. Contact acquisition rate	5				5
08 Work Performance	1. Performance at work	5				5
	2. Problem-solving ability	5				5
09 Creativity & Innovation	1. Rate of new ideas suggested	5				5
	2. Rate of new ideas applied / implemented	5				5
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	5				5
11 Willingness	1. Willingness/motivation to share knowledge with others	5				5
	2. Motivation to develop knowledge and learn new things	5				5
	3. Company's encouragement and recognition of knowledge sharing	5				5

ID#	146
Name:	I
Job Title:	Public Rels Spec I
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	7				7
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	6		5		11
02 Education	1. Level of Education	7		5		12
	2. Proficiency in different languages	7		5		12
	3. Relevance of Education to Job	7		5		12
03 Training	1. Number of technical training courses	7		5		12
	2. Number of soft skills training programs	3		5		8
	3. Impact of training on performance	3		5		8
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5		5		10
	Proficiency in SAP	4		5		9
06 Business Process Interactions	1. Number of business processes used	5	5	5		15
	2. Competence in using business processes and procedures	4	6	5		15
	Involvement in business process design	4	5	5		14
	Involvement in business process improvement	3	4	5		12
07 Personal Network	1. Extent of contacts within the company	5	6	5		16
	2. Extent of contacts external to the company	5	6	5		16
	3. Relevance of contacts to job	5	6	5		16
	4. Contact acquisition rate	5	5	5		15
08 Work Performance	1. Performance at work	5	5	5		15
	2. Problem-solving ability	6	5	5		16
09 Creativity & Innovation	1. Rate of new ideas suggested	6	5	5		16
	2. Rate of new ideas applied / implemented	4	4	5		13
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating	7	7	5		19
11 Willingness	1. Willingness/motivation to share knowledge with others	7	5	5		17
	2. Motivation to develop knowledge and learn new things	7	6	5		18
	3. Company's encouragement and recognition of knowledge sharing	4	5	5		14

ID#	147
Name:	X
Job Title:	Media Rels Spec III
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	5				5
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	3				3
	3. Number of years in the industry	5				5
	4. Relevance of experience to current job	3		5		8
02 Education	1. Level of Education	6		5		11
	2. Proficiency in different languages	2		5		7
	3. Relevance of Education to Job	3		5		8
03 Training	1. Number of technical training courses	1		5		6
	2. Number of soft skills training programs	2		5		7
	3. Impact of training on performance	2		5		7
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	4		5		9
	Proficiency in SAP	1		5		6
06 Business Process Interactions	1. Number of business processes used	4	1	5		10
	2. Competence in using business processes and procedures	4	1	5		10
	Involvement in business process design	4	1	5		10
	Involvement in business process improvement	4	1	5		10
07 Personal Network	1. Extent of contacts within the company	3	3	5		11
	2. Extent of contacts external to the company	5	3	5		13
	3. Relevance of contacts to job	2	2	5		9
	4. Contact acquisition rate	5	2	5		12
08 Work Performance	1. Performance at work	6	7	5		18
	2. Problem-solving ability	6	7	5		18
09 Creativity & Innovation	1. Rate of new ideas suggested	6	6	5		17
	2. Rate of new ideas applied / implemented	6	6	5		17
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating	6	7	5		18
11 Willingness	1. Willingness/motivation to share knowledge with others	7	7	5		19
	2. Motivation to develop knowledge and learn new things	7	7	5		19
	3. Company's encouragement and recognition of knowledge sharing	2	7	5		14

ID#	148
Name:	F
Job Title:	Media Rels Spec II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	2				2
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	2				2
	3. Number of years in the industry	6				6
	4. Relevance of experience to current job	6		5		11
02 Education	1. Level of Education	6		5		11
	2. Proficiency in different languages	3		5		8
	3. Relevance of Education to Job	4		5		9
03 Training	1. Number of technical training courses	5		5		10
	2. Number of soft skills training programs	5		5		10
	3. Impact of training on performance	5		5		10
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	6		5		11
	Proficiency in SAP	3		5		8
06 Business Process Interactions	1. Number of business processes used	6	7	5		18
	2. Competence in using business processes and procedures	6	7	5		18
	Involvement in business process design	6	7	5		18
	Involvement in business process improvement	6	7	5		18
07 Personal Network	1. Extent of contacts within the company	6	7	5		18
	2. Extent of contacts external to the company	6	6	5		17
	3. Relevance of contacts to job	6	7	5		18
	4. Contact acquisition rate	6	5	5		16
08 Work Performance	1. Performance at work	6	7	5		18
	2. Problem-solving ability	6	7	5		18
09 Creativity & Innovation	1. Rate of new ideas suggested	6	5	5		16
	2. Rate of new ideas applied / implemented	6	5	5		16
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating	7	6	5		18
11 Willingness	1. Willingness/motivation to share knowledge with others	6	7	5		18
	2. Motivation to develop knowledge and learn new things	5	6	5		16
	3. Company's encouragement and recognition of knowledge sharing	6	5	5		16

ID#	149
Name:	V
Job Title:	Relations Rep II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	3				3
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	3				3
	3. Number of years in the industry	3				3
	4. Relevance of experience to current job	6		5		11
02 Education	1. Level of Education	4		5		9
	2. Proficiency in different languages	3		5		8
	3. Relevance of Education to Job	6		5		11
03 Training	1. Number of technical training courses	1		5		6
	2. Number of soft skills training programs	4		5		9
	3. Impact of training on performance	6		5		11
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7		5		12
	Proficiency in SAP	2		5		7
06 Business Process Interactions	1. Number of business processes used	1		5		6
	2. Competence in using business processes and procedures	1		5		6
	Involvement in business process design	1		5		6
	Involvement in business process improvement	1		5		6
07 Personal Network	1. Extent of contacts within the company	4		5		9
	2. Extent of contacts external to the company	4		5		9
	3. Relevance of contacts to job	5		5		10
	4. Contact acquisition rate	5		5		10
08 Work Performance	1. Performance at work	6		5		11
	2. Problem-solving ability	6		5		11
09 Creativity & Innovation	1. Rate of new ideas suggested	5		5		10
	2. Rate of new ideas applied / implemented	5		5		10
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating	7		5		12
11 Willingness	1. Willingness/motivation to share knowledge with others	7		5		12
	2. Motivation to develop knowledge and learn new things	7		5		12
	3. Company's encouragement and recognition of knowledge sharing	6		5		11

ID#	150
Name:	R
Job Title:	Relations Rels Rep II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	4				4
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	1				1
	3. Number of years in the industry	5				5
	4. Relevance of experience to current job	6		5		11
02 Education	1. Level of Education	4		5		9
	2. Proficiency in different languages	3		5		8
	3. Relevance of Education to Job	6		5		11
03 Training	1. Number of technical training courses	3		5		8
	2. Number of soft skills training programs	3		5		8
	3. Impact of training on performance	2		5		7
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7		5		12
	Proficiency in SAP	5		5		10
06 Business Process Interactions	1. Number of business processes used	3	1	5		9
	2. Competence in using business processes and procedures	4	1	5		10
	Involvement in business process design	4	1	5		10
	Involvement in business process improvement	4	1	5		10
07 Personal Network	1. Extent of contacts within the company	6	5	5		16
	2. Extent of contacts external to the company	7	5	5		17
	3. Relevance of contacts to job	5	4	5		14
	4. Contact acquisition rate	7	3	5		15
08 Work Performance	1. Performance at work	6	4	5		15
	2. Problem-solving ability	6	4	5		15
09 Creativity & Innovation	1. Rate of new ideas suggested	7	4	5		16
	2. Rate of new ideas applied / implemented	6	4	5		15
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating	6	5	5		16
11 Willingness	1. Willingness/motivation to share knowledge with others	7	2	5		14
	2. Motivation to develop knowledge and learn new things	7	3	5		15
	3. Company's encouragement and recognition of knowledge sharing	5	4	5		14

ID#	152
Name:	E
Job Title:	Public Rels Rep I
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	6				6
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	6				6
	3. Number of years in the industry	6				6
	4. Relevance of experience to current job	6				6
02 Education	1. Level of Education	6				6
	2. Proficiency in different languages	2				2
	3. Relevance of Education to Job	6				6
03 Training	1. Number of technical training courses	4				4
	2. Number of soft skills training programs	5				5
	3. Impact of training on performance	5				5
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	4				4
	Proficiency in SAP	4				4
06 Business Process Interactions	1. Number of business processes used	4	6			10
	2. Competence in using business processes and procedures	6	6			12
	Involvement in business process design	6	6			12
	Involvement in business process improvement	5	6			11
07 Personal Network	1. Extent of contacts within the company	5	6			11
	2. Extent of contacts external to the company	5	6			11
	3. Relevance of contacts to job	6	6			12
	4. Contact acquisition rate	6	6			12
08 Work Performance	1. Performance at work	6	5			11
	2. Problem-solving ability	6	6			12
09 Creativity & Innovation	1. Rate of new ideas suggested	6	6			12
	2. Rate of new ideas applied / implemented	6	5			11
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	6	6			12
11 Willingness	1. Willingness/motivation to share knowledge with others	6	5			11
	2. Motivation to develop knowledge and learn new things	6	6			12
	3. Company's encouragement and recognition of knowledge sharing	6	6			12

ID#	153
Name:	P
Job Title:	Public Rels Spec II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	3				3
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	3				3
	3. Number of years in the industry	3				3
	4. Relevance of experience to current job	5				5
02 Education	1. Level of Education	6				6
	2. Proficiency in different languages	3				3
	3. Relevance of Education to Job	7				7
03 Training	1. Number of technical training courses	1				1
	2. Number of soft skills training programs	2				2
	3. Impact of training on performance	6				6
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5				5
	Proficiency in SAP	5				5
06 Business Process Interactions	1. Number of business processes used	4	5			9
	2. Competence in using business processes and procedures	4	5			9
	Involvement in business process design	4	5			9
	Involvement in business process improvement	4	5			9
07 Personal Network	1. Extent of contacts within the company	7	5			12
	2. Extent of contacts external to the company	6	5			11
	3. Relevance of contacts to job	7	5			12
	4. Contact acquisition rate	6	5			11
08 Work Performance	1. Performance at work	7	3			10
	2. Problem-solving ability	6	2			8
09 Creativity & Innovation	1. Rate of new ideas suggested	6	2			8
	2. Rate of new ideas applied / implemented	6	3			9
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	6	3			9
11 Willingness	1. Willingness/motivation to share knowledge with others	7	5			12
	2. Motivation to develop knowledge and learn new things	7	3			10
	3. Company's encouragement and recognition of knowledge sharing	5	3			8

ID#	154
Name:	T
Job Title:	Supervisor
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	6				6
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	3				3
	3. Number of years in the industry	6				6
	4. Relevance of experience to current job	4		1		5
02 Education	1. Level of Education	4		4		8
	2. Proficiency in different languages	7		2		9
	3. Relevance of Education to Job	3		1		4
03 Training	1. Number of technical training courses	1		1		2
	2. Number of soft skills training programs	2		1		3
	3. Impact of training on performance	3		1		4
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5		2		7
	Proficiency in SAP	5		1		6
06 Business Process Interactions	1. Number of business processes used	5	7	2		14
	2. Competence in using business processes and procedures	5	7	2		14
	Involvement in business process design	5	7	2		14
	Involvement in business process improvement	5	7	2		14
07 Personal Network	1. Extent of contacts within the company	6	7	4		17
	2. Extent of contacts external to the company	6	7	4		17
	3. Relevance of contacts to job	6	7	4		17
	4. Contact acquisition rate	6	7	4		17
08 Work Performance	1. Performance at work	6	7	4		17
	2. Problem-solving ability	6	7	3		16
09 Creativity & Innovation	1. Rate of new ideas suggested	5	7	2		14
	2. Rate of new ideas applied / implemented	5	7	2		14
10 Market Value	Job Tier			4		4
	Salary Scale			4		4
12 Overall	Overall individual knowledge rating	6	7	4		17
11 Willingness	1. Willingness/motivation to share knowledge with others	7	7	4		18
	2. Motivation to develop knowledge and learn new things	7	7	3		17
	3. Company's encouragement and recognition of knowledge sharing	5	7	3		15

ID#	155
Name:	G
Job Title:	Public Rels Rep II
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	6				6
	3. Number of years in the industry	4				4
	4. Relevance of experience to current job	6		7		13
02 Education	1. Level of Education	4		4		8
	2. Proficiency in different languages	3		5		8
	3. Relevance of Education to Job	4		4		8
03 Training	1. Number of technical training courses	6		5		11
	2. Number of soft skills training programs	6		5		11
	3. Impact of training on performance	6		5		11
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	7		6		13
	Proficiency in SAP	5		6		11
06 Business Process Interactions	1. Number of business processes used	4		5		9
	2. Competence in using business processes and procedures	5		5		10
	Involvement in business process design	5		5		10
	Involvement in business process improvement	5		5		10
07 Personal Network	1. Extent of contacts within the company	5		5		10
	2. Extent of contacts external to the company	6		5		11
	3. Relevance of contacts to job	5		5		10
	4. Contact acquisition rate	5		5		10
08 Work Performance	1. Performance at work	6		7		13
	2. Problem-solving ability	6		7		13
09 Creativity & Innovation	1. Rate of new ideas suggested	5		6		11
	2. Rate of new ideas applied / implemented	4		5		9
10 Market Value	Job Tier			5		5
	Salary Scale			5		5
12 Overall	Overall individual knowledge rating	5		6		11
11 Willingness	1. Willingness/motivation to share knowledge with others	5		7		12
	2. Motivation to develop knowledge and learn new things	6		7		13
	3. Company's encouragement and recognition of knowledge sharing	5		4		9

ID#	156
Name:	Q
Job Title:	Public Rels Rep I
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	7				7
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	7				7
	3. Number of years in the industry	7				7
	4. Relevance of experience to current job	7		6		13
02 Education	1. Level of Education	3		3		6
	2. Proficiency in different languages	2		5		7
	3. Relevance of Education to Job	3		5		8
03 Training	1. Number of technical training courses	6		5		11
	2. Number of soft skills training programs	6		5		11
	3. Impact of training on performance	5		6		11
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	6		6		12
	Proficiency in SAP	6		6		12
06 Business Process Interactions	1. Number of business processes used	3				3
	2. Competence in using business processes and procedures	3				3
	Involvement in business process design	3				3
	Involvement in business process improvement	3				3
07 Personal Network	1. Extent of contacts within the company	5				5
	2. Extent of contacts external to the company	4				4
	3. Relevance of contacts to job	4				4
	4. Contact acquisition rate	4				4
08 Work Performance	1. Performance at work	6				6
	2. Problem-solving ability	5				5
09 Creativity & Innovation	1. Rate of new ideas suggested	5				5
	2. Rate of new ideas applied / implemented	4				4
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	5				5
11 Willingness	1. Willingness/motivation to share knowledge with others	7				7
	2. Motivation to develop knowledge and learn new things	6				6
	3. Company's encouragement and recognition of knowledge sharing	7				7

ID#	142
Name:	Z
Job Title:	Media Rels Spec III
Department:	PR

		Self	Peer	Manager	Sub-Ordinate	Overall
01 Experience	1. Number of years in the company	4				4
	2. Number of years in the function (e.g. Sales, HR, ...etc.)	4				4
	3. Number of years in the industry	4				4
	4. Relevance of experience to current job	2				2
02 Education	1. Level of Education	6				6
	2. Proficiency in different languages	5				5
	3. Relevance of Education to Job	1				1
03 Training	1. Number of technical training courses	1				1
	2. Number of soft skills training programs	3				3
	3. Impact of training on performance	4				4
04 IT Literacy	Proficiency in Microsoft Office (includes 3 applications: Word, Excel and PowerPoint)	5				5
	Proficiency in SAP	2				2
06 Business Process Interactions	1. Number of business processes used	1	1			2
	2. Competence in using business processes and procedures	1	1			2
	Involvement in business process design	1	1			2
	Involvement in business process improvement	1	1			2
07 Personal Network	1. Extent of contacts within the company	2	2			4
	2. Extent of contacts external to the company	2	2			4
	3. Relevance of contacts to job	3	2			5
	4. Contact acquisition rate	2	2			4
08 Work Performance	1. Performance at work	3	4			7
	2. Problem-solving ability	4	4			8
09 Creativity & Innovation	1. Rate of new ideas suggested	2	5			7
	2. Rate of new ideas applied / implemented	2	5			7
10 Market Value	Job Tier					0
	Salary Scale					0
12 Overall	Overall individual knowledge rating	4	4			8
11 Willingness	1. Willingness/motivation to share knowledge with others	3	4			7
	2. Motivation to develop knowledge and learn new things	3	3			6
	3. Company's encouragement and recognition of knowledge sharing	2	4			6

Appendix D - Results of MinK

Participants	IK-INDEX
P1	6.60
P2	6.30
P3	6.26
P4	5.68
P5	5.47
P6	5.46
P7	5.44
P8	5.41
P9	5.27
P10	5.20
P11	5.16
P12	5.12
P13	5.07
P14	5.00
P15	4.94
P16	4.89
P17	4.84
P18	4.81
P19	4.72
P20	4.69
P21	4.61
P22	4.56
P23	4.55
P24	4.53
P25	4.22
P26	2.96